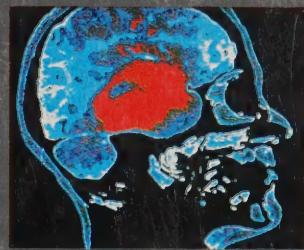


POWER GRID TUBE CATALOG



About the Cover:

The diversity and reliability of our power grid tubes have made Varian a respected name worldwide. Customers know that their purchase of Varian's Eimac or Machlett products is backed by a company with over fifty years of experience.

Varian understands that each market we supply—broadcast, defense, industrial, medical, and scientific—has its own distinct requirements. That is why Varian is committed to providing power grid tubes that respond to every specific application and every budget.

Broadcast

Varian offers tubes for AM, FM, and shortwave radio applications as well as UHF and VHF-Television. Providing broadcasters with good value, and reliable, efficient tubes is our priority.

Defense

The advanced design and performance of Varian's power grid tubes are ideal for their use in high voltage switches and regulators for radar and electronic countermeasures and in RF amplifiers and modulators for defense communications. Varian is a qualified supplier for programs such as AEGIS, Patriot, and the Strategic Defense Initiative.

Industrial

Varian's ruggedized power grid tubes are perfect for a wide variety of industrial applications including RF welding for plastic sealing; RF heating for metal tempering, drying, curing and wood processing; and RF power for semiconductor sputtering, plasma generators and ion implantation. Our oscillators and triodes are built to withstand harsh environments and they're priced for value.

Medical and Scientific

Our family of reliable high power RF and high voltage tubes are critical to the scientific community for their use in particle accelerators, nuclear magnetic resonance, isotope enrichment, and big science fusion. In addition, Varian's RF pulse and high voltage regulators are used in magnetic resonance imaging, computer-aided tomography, medical accelerators, and lasers.



EXTENDING TRANSMITTER TUBE LIFE

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EIMAC APPLICATION BULLETIN NO. 18

A carefully followed program of filament voltage management can substantially increase the life expectancy of transmitter power grid tubes. With today's rising operating costs, such a program makes good financial sense.

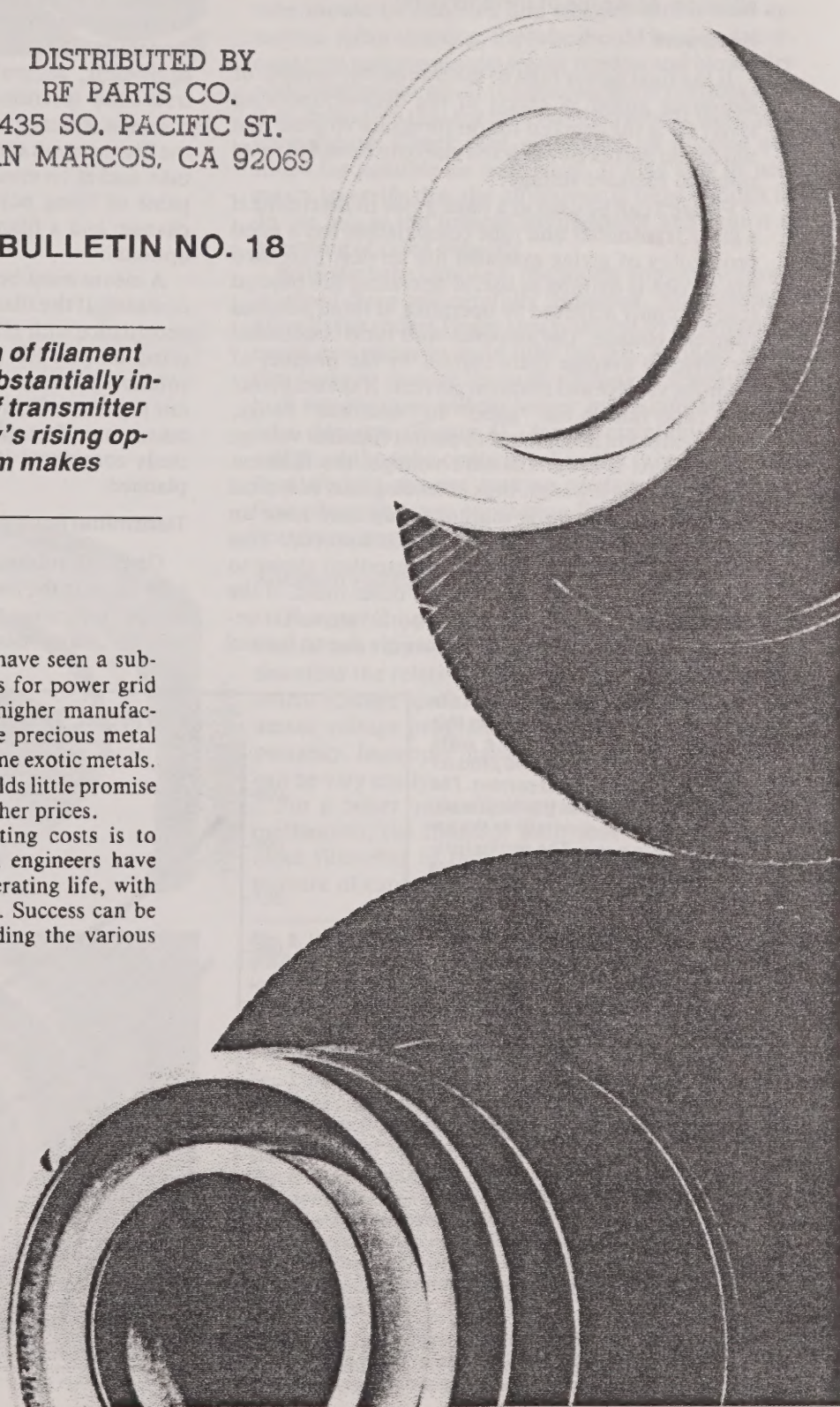
IN RECENT YEARS station managers have seen a substantial increase in replacement costs for power grid tubes. The blame can be placed on higher manufacturing costs due to inflation, volatile precious metal prices, and an uncertain supply of some exotic metals. The current outlook for the future holds little promise for a reversal in this trend toward higher prices.

One way to offset higher operating costs is to prolong tube life. For years station engineers have used various tricks to get longer operating life, with greater and lesser degrees of success. Success can be maximized, however, by understanding the various



301 Industrial Way
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Extending Transmitter Tube Life

factors that affect tube life and implementing a program of filament voltage management.

A number of factors can aid maximum tube life in your transmitter. For example, are the maximum ratings given on the tube manufacturer's data sheet being exceeded? Data sheets are available upon request from most companies. Most tube manufacturers have an application engineering department to assist in evaluating tube performance for a given application. Make use of these services!

Headroom

Is the final power tube of the transmitter capable of delivering power in excess of the desired operating level? Or is the demand for performance so great that minimum output power levels can only be met at rated nominal filament voltage?

Figure 1 can be used as a basic guide to determine if a given transmitter and tube combination has a good probability of giving extended life service. Extended life service is defined as useful operating life beyond that normally achieved by operating at rated nominal filament voltage. The amperes/watt ratio is obtained by dividing average plate current by the product of filament voltage and filament current. If the amperes/watt ratio falls in the "good" to "excellent" range, excess emission is sufficient to permit filament voltage derating. At a lower filament voltage, the filament temperature is lowered, thus extending life. A typical FM transmitter on the market today may have an amperes/watt filament ratio of 0.002 to 0.003. This equipment would be considered an excellent choice to achieve extended tube life. On the other hand, if the amperes/watt ratio falls in the "poor" range, it is unlikely that filament derating is possible due to limited

emission. Note that this guideline should be used for thoriated tungsten emitters only, and does not apply to oxide cathode-type tubes.

Instrumentation

Are all tube elements metered in the transmitter? Elements should be metered for both voltage and current, and meters should be redlined to define operation within safe limits. More modern transmitters may incorporate a microprocessor-controlled circuit to monitor all pertinent parameters.

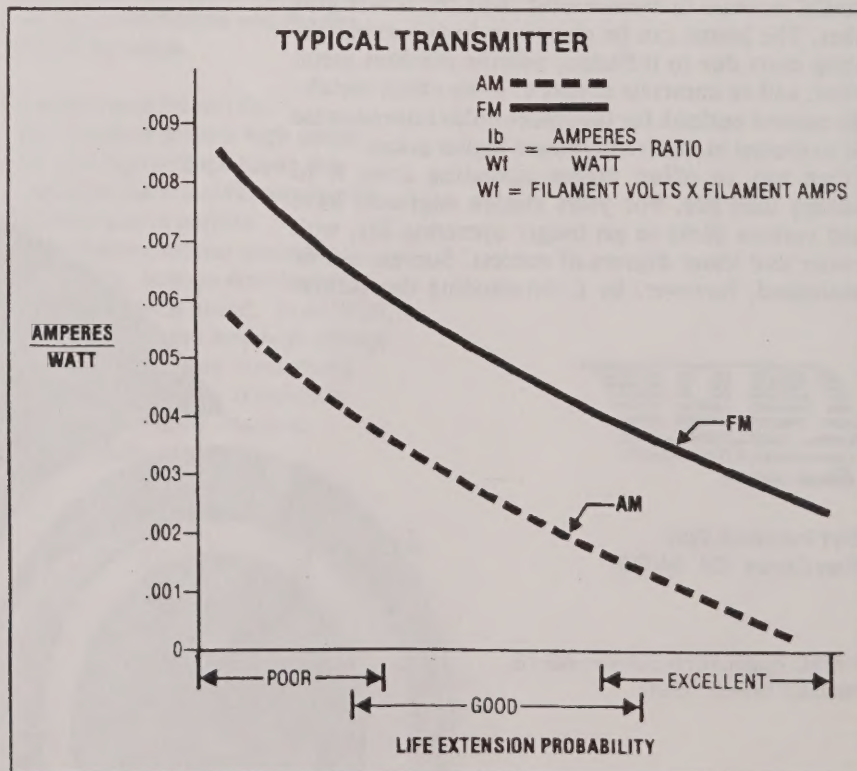
In addition, the following controls are necessary if an effective filament voltage management program is to be undertaken: power output metering for an FM transmitter or a distortion level meter for AM equipment; *accurate* filament voltage metering (an iron-vane instrument is preferred over the more common average responding RMS calibrated type; the filament voltage measurement must be made at the tube socket terminals); filament voltage control, capable of being adjusted to 0.1 V secondary voltage change; and a filament current meter—desirable but optional.

A means must be provided to hold filament voltage constant. If the filament voltage is permitted to vary in accordance with primary line voltage fluctuation, the effect on tube life can be devastating. An acceptable solution is the use of a ferroresonant transformer or line regulator. This accessory is offered by some transmitter manufacturers as an option and should be seriously considered if a tube life extension program is planned.

Transmitter housekeeping

Once the transmitter has been placed in operation, tube life is in the hands of the chief engineer. The first action to prolong tube life falls into the category of routine maintenance. Most transmitter manufac-

Fig. 1. Probability of extended life service can be determined from this graph. Divide the average p.a. plate current in amperes by the product of filament voltage and current. The resulting amperes/watt ratio (Y-axis) is projected horizontally to the appropriate curve. The vertical projection to the X-axis indicate the life extension probability.



Extending Transmitter Tube Life

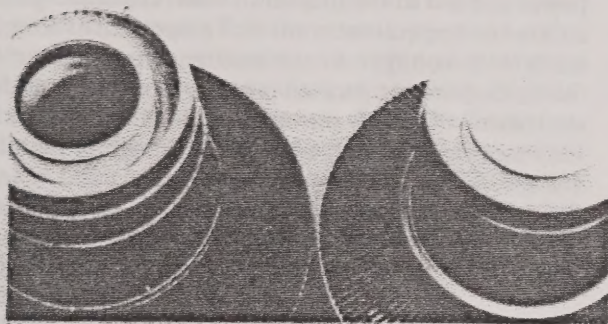


Figure 2

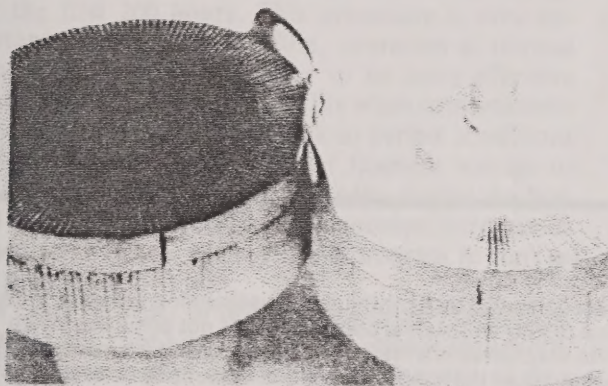


Figure 3

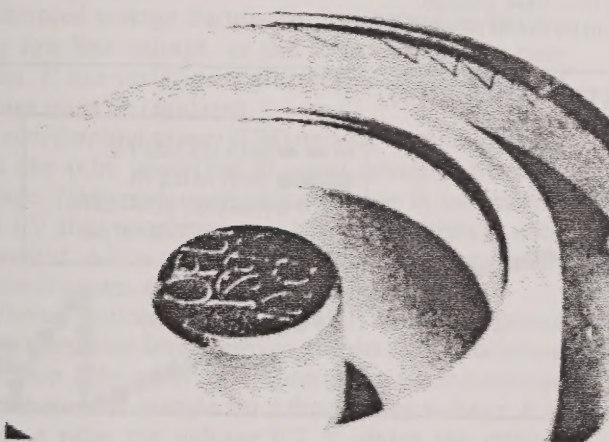


Figure 4

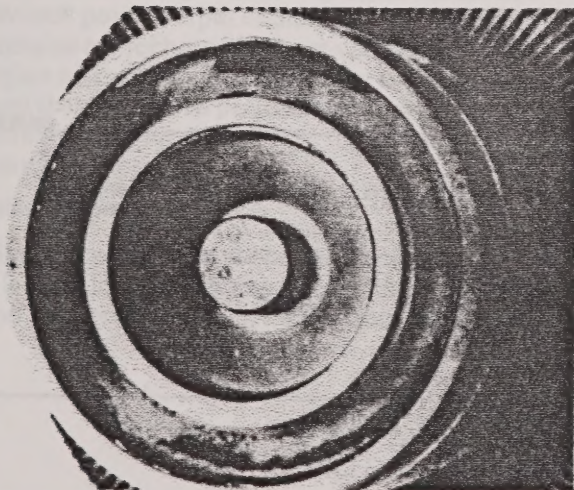


Figure 5

turers have a routine maintenance schedule established in the equipment manual. This procedure must be followed carefully if operating costs are to be held to a minimum. During routine maintenance it is very important to look for tube and socket discoloration, either of which can indicate overheating.

Look for discoloration around the top of the cooler near the anode core and at the bottom of the tube stem where the filament contacts are made. Review Figures 2 and 3 for examples of a tube operating with inadequate cooling. It is possible for discoloration to appear in the areas mentioned if the transmitter has to operate in a dirty environment. If this is the case, the tube should be removed and cleaned with a mild detergent. After cleaning, the tube should be rinsed thoroughly to remove any detergent residue and blown dry with compressed air. If the discoloration remains, this is an indication that the tube has operated at too high a temperature. Check inlet and outlet air ducting and filters for possible air restriction. It may also be necessary to verify that the air blower is large enough to do the job in the present environment and that it is operating at rated capacity.

With the tube removed, the socket should be blown or wiped clean and carefully inspected. Any discoloration in the socket finger stock caused by overheating could contribute to early tube failure. A finger stock that loses its temper through prolonged operation at high temperature will no longer make contact to the tube elements (Figure 4). A well-maintained socket will score the tube contacts when the tube is inserted. If all fingers are not making contact, more current flows through fewer contacting fingers, causing additional overheating and possible burnout (Figure 5).

Filament voltage management

The useful operating life of a thoriated tungsten emitter can vary widely with filament voltage. Figure 6 describes the relative life expectancy with various filament voltage levels. Obviously, a well-managed filament voltage program will result in longer life expectancy. Improper management, on the other hand, can be very costly.

For a better understanding of this sensitive aging mechanism, the filament itself must be understood. Most filaments in high-power, gridded tubes are a mixture of tungsten and thoria with a chemical com-

Fig. 2. Improper cooling means short tube life (left). Discoloration of metal around inner filament stem and anode fins indicates poor cooling or improper operation of tube. Properly cooled and operated tube (right) shows no discoloration after many hours of use. In both cases, good socketting is indicated by scoring on circular connector rings.

Fig. 3. Dirty and discolored cooler of amplifier tube at left indicates combination of discoloration due to heating and lack of cleaning. Tube has operated too hot and dust has collected in anode louvers.

Fig. 4. Minute scoring in base contact rings indicates that socket finger stock has made good, low-resistance contact to tube elements. Well-maintained socket will score the tube contacts when tube is inserted. If all fingers do not make contact, more current will flow through fewer contact fingers, causing additional overheating and burning, as shown in Fig. 5.

Fig. 5. High resistance socket contacts has caused severe burning of contact area in the base. Overheated base caused early demise of tube.

Extending Transmitter Tube Life

position of $W + ThO_2$. A filament made of this wire is not a suitable electron emitter for extended life applications until it is processed. Once the filament is formed into the desired shape and mounted, it is heated to approximately $2100^{\circ}C$ in the presence of a hydrocarbon. The resulting thermochemical reaction forms di-tungsten carbide on the filament's surface. Life is proportional to the degree of carburization. If the filament is overcarburized, however, it will be brittle and easily broken during handling and transporting. Therefore, only approximately 25% of the cross-sectional area of the wire is converted to di-tungsten carbide. Di-tungsten carbide has a higher resistance than tungsten; thus, the reaction can be carefully monitored by observing the reduction in filament current as the carburizing process proceeds.

As the tube is used the filament slowly decarburizes. At some point in life, all of the di-tungsten carbide layer is depleted and the reduction of thorium to free

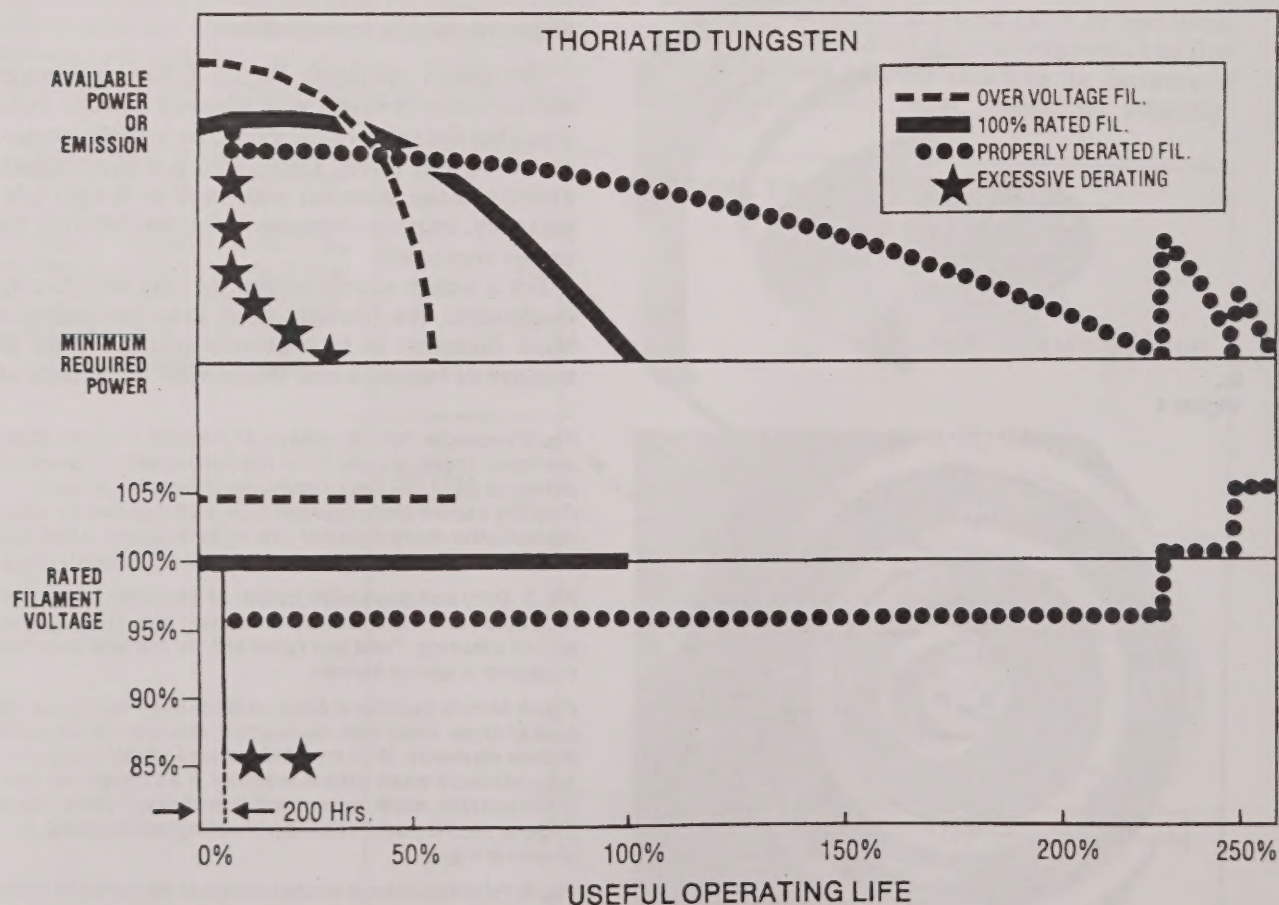
thorium stops. The filament is now decarburized and is no longer an effective electron emitter.

The key to extending the life of a thoriated tungsten filament emitter is to control operating temperature. Emitter temperature is a function of the total RMS power applied to the filament. Thus, filament voltage control is temperature control. Temperature varies directly with voltage. As the emitter temperature rises the de-carburizing process is accelerated and tube life shortened. Figure 6 shows that useful tube life can vary significantly with only a 5% change in filament voltage.

FILAMENT VOLTAGE MANAGEMENT (Figure 6)

Filament voltage management allows extended tube life when accompanied by a continuing housekeeping program. When filament voltage is too high (dashes), power tube loses emission rapidly and normal operating life is not achieved. When filament is operated at rated voltage (black curve) normal tube life is achieved in a majority of cases. With a filament voltage management program (bullets), extended tube life may be achieved. When the minimum required output power level is finally reached (right-hand portion of curve), the filament voltage may be raised to rated value, or above, to achieve additional useful operating life. If filament is run "cool" (stars), extremely short life will result. Note that filament voltage management program does not take effect until about 200 hours of operating time have passed.

If voltage management program is not undertaken, tube should be run at rated filament voltage.



Extending Transmitter Tube Life

Of great importance to long tube life is the temperature of the elements and the ceramic-to-metal seals. Element temperature can be held within proper limits by observing the maximum dissipation ratings listed in the data sheet. Seal temperature should be limited to 200°C at the lower anode seal under worst-case conditions. As element temperature rises beyond 200°C, the release of contaminants locked in the materials used in tube manufacturing increases rapidly. These contaminants cause a rapid depletion of the di-tungsten carbide layer of the filament.

When a new power tube is installed in a transmitter, it must be operated at rated nominal filament voltage for the first 200 hours. This procedure is very important for two reasons. First, operation at normal temperature allows the getter to be more effective during the early period of tube life when contaminants are more prevalent. This break-in period conditions the tube for operation at lower filament voltage to obtain longer filament life. Secondly, during the first 200 hours of operation filament emission increases. It is necessary for the life extension program to start at the peak emission point.

A chart recorder or other device should be used to monitor variations in primary line voltage for several days of transmitter operation. The history of line voltage variations during on-air time must be reviewed prior to derating filament voltage. Plan to establish the derated voltage during the time period of historically low line voltage, as this is the worst-case condition. If line variation is greater than $\pm 3\%$, filament voltage must be regulated.

Record output power (FM) or distortion level (AM) with the tube operating at rated nominal filament voltage. Next, reduce filament voltage in increments of 0.1 V and record power or distortion levels at each increment. Allow one minute between each increment for the filament emission to stabilize.

When a noticeable change occurs in output power or the distortion level changes, the derating procedure must stop. Obviously, operation at this point is unwise since there is no margin for a drop in line voltage. It is safer to raise the voltage 0.2 V above the critical voltage at which changes are observed to occur. Finally, recheck power output or distortion to see if they are acceptable at the chosen filament voltage level. Recheck again after 24 hours to determine if emission is stable and that the desired performance is maintained. If performance is not repeatable, the derating procedure must be repeated.

Continuing the program

The filament voltage should be held at the properly derated level as long as minimum power or maximum distortion requirements are met. Filament voltage can

be raised to reestablish minimum requirements as necessary. This procedure will yield results similar to those shown in the illustration, to achieve as much as 10% to 15% additional life extension. When it becomes necessary to increase filament voltage, it is a good time to order a new tube. Filament voltage can be increased as long as the increase results in maintaining minimum level requirements.

When an increase fails to result in meeting a level requirement, filament emission must be considered inadequate and the tube should be replaced. Don't discard it or sell it for scrap! Put it on the shelf and save it. It will serve as a good emergency spare and may come in very handy some day. Also, in AM transmitters, a low-emission RF amplifier tube can be shifted to modulator use where the peak filament emission requirement is not as severe.

Start planning for longer tube life now! Review the following steps you can take:

- Investigate the manufacturer's ratings on the power tubes in your present equipment, or the transmitter you plan to buy.
- Check that your transmitter has sufficient headroom. Is there a margin of safety in tube operation?
- Look for important instrumentation in the next transmitter you buy. Are all tube elements monitored for voltage and current in the transmitter?
- Whether your transmitter is new or old, start a filament life extension program.


Remember that each time you replace a power tube, the recommended derating procedure must be rerun. Voltage levels required with one tube do not apply to a replacement tube.

When purchasing a tube, insist on a new tube that carries the full, original manufacturer's warranty. Only tubes manufactured by the company of origin have to perform to published data. This is the important reason that transmitter manufacturers buy new, warranted tubes from the original manufacturer.

Thanks to William Barkley, William Orr, William Sain, and Bob Tornoe, all of EIMAC, for their help and suggestions in preparing this paper.

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For power grid tube information, call 1-800-432-4422. Press five for San Carlos or press four for Salt Lake City. The point of manufacture for each tube type is listed on page two.

CATALOG INDEX

Electron Tubes are listed alpha-numerically by the Eimac Type Number and sequentially by the 4-digit EIA (Electronic Industries Association) number. Thus, if a tube has been assigned an EIA number it can be looked up either way. X-number and Y-number tubes are shown at the end of the

Electron Tubes listing, as are Cavity Amplifiers, Cavity Oscillators, various hardware items.

Also listed is the point of manufacture for each product: SC for the San Carlos facility, SL for the Salt Lake City facility.

POINT OF PAGE MFG.			POINT OF PAGE MFG.			POINT OF PAGE MFG.			POINT OF PAGE MFG.			POINT OF PAGE MFG.			POINT OF PAGE MFG.		
ELECTRON TUBES																	
2CX10,000F	130	SL	3CX15,000A7	53	SC	4CX12,000A/8989	90	SC	8246/4CX250M	79	SC	Y-808/4KC/160M	130	SC	ML-6696A	126	SC
2C39A	130	SL	3CX15,000B7	53	SC	4CX15,000A/8281	91	SC	8247/4PR125A	130	SL	Y-810	31	SL	ML-6697	130	SC
2C39BA	130	SL	3CX15,000H3	54	SC	4CX15,000J/8910	91	SC	8248/4PR250C	119	SL	Y-811	31	SL	ML-6697A	127	SC
2C39WA	130	SL	3CX20,000A3	54	SC	4CX15,000R	91	SC	8251/3CX2500F3	44	SL	Y-812	31	SL	ML-7003, ML-7003A	127	SL
2KDX15LA Klystron	131	SC	3CX20,000A7	55	SC	4CX20,000A/8990	92	SC	8252W/4PR60C	118	SL	Y-820	31	SL	ML-7248	128	SL
2KDX15LF Klystron	131	SC	3CX20,000H3	55	SC	4CX20,000B	92	SC	8281/4CX15,000A	91	SC	Y-834	96	SL	ML-7482	128	SC
2KDW40LA Klystron	131	SC	3K600J/Y-872	73	SL	4CX20,000C	93	SC	8283/3CX1000A7	41	SL	Y-841/4CPW100KA	114	SC	ML-7560	129	SC
2KDW40LF Klystron	131	SC	4-65A/8165	116	SL	4CX20,000D/9015	93	SC	8295A	125	SL	Y-842A/3CW7000H3	62	SL	ML-7715, ML-LPT-62	129	SC
2KDX40LA Klystron	131	SC	4-125A/4D21	116	SL	4CX25,000A	94	SC	8321/4CX350A	81	SC	Y-847	33	SL	ML-8773	130	SC
2KDX40LF Klystron	131	SC	4-250A/5D22	117	SL	4CX35,000C/8349	94	SC	8322/4CX350F	81	SC	Y-863	96	SC	ML-8795	130	SC
2KDW60LA Klystron	131	SC	4-400A/8438	117	SL	4CX40,000G	95	SC	8349/4CX35,000C	94	SC	Y-872/3CX600	73	SL	ML-23165	130	SC
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3-400Z/8163	130	SL	4-400C/6775	117	SL	4D21/4-125A	116	SL	8352/4CX1000K	84	SL	YU-106/3CW7000F7	62	SL	ML-23431	130	SC
3-500Z	70	SL	4-500A	130	SL	4KC/160M-Y808	130	SC	8403	130	SL	YU-108/3CX4500F3	47	SL	ML-23646	130	SC
3-1000H	71	SL	4-500B	130	SL	4PR60C/8252W	118	SL	8438/4-400A	117	SL	YU-113	33	SL			
3-1000Z/8164	72	SL	4-1000A/8166	118	SL	4PR65A/8187	130	SL	8533	130	SL	YU-118/4X600	121	SL	ACCESSORIES		
3CPN10A5/7815	130	SL	4CM2500KG/X2274	100	SC	4PR125A/8247	130	SL	8533W	130	SL	YU-121/3CX1200D7	42	SL	Sockets, Chimeys,		
3CPX100A5/7815R	130	SL	4M300,000G/9000	100	SC	4PR250C/8248	119	SL	8538B	25	SL	YU-132	34	SL	Boilers, Etc.	145	SC
3CPX800A7	36	SC	4CM400,000A	101	SC	4PR400A/8188	119	SL	8560A3	122	SC	YU-136	74	SL			
3CPX1500A7	36	SL	4CM400,000AG	101	SC	4PR1000A/8189	120	SL	8561/4CX300Y	80	SC	YU-140	74	SL	Heat sink adaptors		
3CPX3500U7	37	SC	4CN15A	130	SC	4PR1000B	130	SL	8590/4CPX250K	76	SC	YU-141	34	SL	for planar triodes	165	SL
3CPX5000A7	37	SC	4CPL1000A	102	SC	4X150A/7034	130	SC	8621/4CX250F7	77	SC	YU-146	75	SL			
3CV30,000A1	130	SC	4CPL1000B	102	SC	4X150D	130	SC	8660/4CX1500B	85	SL	YU-148/3CX6000A7	49	SL	Heat dissipating		
3CV30,000A3	130	SC	4CPL1000C	102	SC	4X150G/8172	130	SC	8661/4CW10,000A	104	SC	YU-155	115	SL	connectors	166	SC
3CV30,000H3	130	SC	4CPW10,000R/9016	103	SC	4X500A	130	SL	8745/7815R	130	SL	YU-157/3CW2500C7	59	SL			
3CW2000A7	130	SL	4CPW100KA/Y-841	114	SC	4X600/YU-118	121	SL	8755	24	SL	YU-176	28	SL	Tube collars	164	SC
3CW2000D3	59	SL	4CPW300,000A/9008	112	SC	5-500A	130	SL	8757	24	SL	YU-179	115	SL			
3CW2500C7/YU-157	59	SL	4CPW1000KA/9009	112	SC	5CX1500A	123	SL	8809/4CX600J	83	SC	YU-181/3CX1200Z7	42	SL	Parts Kits	164	SC
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3CW5000A3/8242	60	SL	X2062M	113	SC	5CX3000A/8966	124	SL	8873	58	SC	YU-199/3CX4000F3	46	SL	Special Sockets	165	SC
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3CW5000F1/8241	61	SL	4CS250R	122	SC	250IH	130	SL	8875	56	SC	YU-338	32	SL	Tube Extractors	167	SC
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3CW5000F7	130	SL	4CV35,000A	130	SC	264/8576	130	SL	8904/4CX350FJ	82	SC	CAVITY AMPLIFIERS			Finger Stock	167	SC
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3CX800A7	39	SC	4CW250,000B	109	SC	7815/3CPN10A5	130	SL	8972	69	SC	CV-5202	142	SC			
3CX800U7	40	SC	4CX125C	130	SC	7815AL	130	SL	8973	110	SC	CV-5900	142	SC			
3CX1000A3	40	SL	4CX250B/7203	77	SC	7815R/3CPX100A5	130	SL	8974	111	SC	CV-8020	141	SL			
3CX1000A7/8283	41	SL	4CX250B/8957	78	SC	7815RAL	130	SL	8989/4CX12,000A	90	SC	CV-8030	142	SL			
3CX1200A7	41	SL	4CX250B/	130	SC	7855	23	SL	8990/4CX20,000A	92	SC	CV-8031	142	SL			
3CX1200D7/YU-121	42	SL	4CX250F/8621	77	SC	7855K	130	SL	9000/4CM300,000G	100	SC	CV-8032	142	SL			
3CX1200Z7/YU-181	42	SL	4CX250K/8245	79	SC	7855KAL	23	SL	9008/4CPW300,000A112	SC		CV-8037	142	SL			
3CX1500A7/8877	43	SL	4CX250M/8246	79	SC	8158/3CX10,000A1	50	SC	9009/4CPW1000KA	112	SC	Klystron Cavities	131	SC			
3CX1500C7/8938	43	SL	4CX250R/7580W	79	SC	8159/3CX10,000A3	50	SC	9013/Y676A	113	SC	CAVITY OSCILLATORS					
3CX1500D3	44	SL	4CX300A/8167	80	SC	81											

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INTRODUCTION

Varian Power Grid & X-ray Tube Products manufactures a complete line of power grid tubes, X-ray tubes and accessories, including cavities and associated equipment.

Major production at the San Carlos plant includes manufacture of large ceramic/metal power grid tubes, cavities and accessories, plus some small ceramic/metal tubes. Glass power tubes, smaller ceramic/metal tubes and a wide line of planar triode tubes and X-ray tubes are major items manufactured at the Salt Lake City plant.

These two facilities, among the most modern electron tube production plants in the world, have all the manufacturing areas designed on a product flow system for maximum efficiency. Clean rooms for critical assembly work are ventilated and filtered for maximum product yield and reliability. Varian developed large rotary vacuum pumps provide a high production rate. Facilities for processing ceramic materials include some of the most modern equipment available. Extensive environmental test equipment is at hand for checking product performance under extreme conditions of shock, vibration, humidity and high altitude.

The Advanced Products Laboratories at both facilities provide product evaluation, application data, prototype production and precision testing of tube and circuit designs. The Laboratory model shops and tube design engineers are available to assist equipment manufacturers and prime users of EIMAC products with unique applications.

Existing experimental designs can be adapted by the Laboratories to meet specific customer requirements. Newly developed tube types and circuit techniques are continually being evaluated in the Power Grid & X-Ray Tube Products Laboratories.

Application Engineering and Marketing Services are available from both the San Carlos and Salt Lake City facilities, as well as from any of the Varian Electron Device sales offices throughout the world. **In order to facilitate prompt response, inquiries should be directed to the facility manufacturing the specific product.** The Tube and Component Index on the preceding pages lists the point of manufacture of each EIMAC product by the nomenclature (SC) for San Carlos or (SL) for Salt Lake City.

INTERPRETATION OF CATALOG DATA

Data provided for EIMAC products in this catalog include maximum ratings, typical operation characteristics and a brief description of the product.

The **maximum ratings** are based on the "absolute system" and are not to be exceeded under **any** service conditions. These ratings are limiting values outside which the serviceability of any individual tube may be impaired. In order not to exceed absolute ratings, the designer has the responsibility of determining an average design value for each rating below the absolute value of that rating by a safety factor so that the absolute values will never be exceeded under any usual conditions of the supply-voltage variation, load variation, or manufacturing variations in the equipment itself. It does not necessarily follow that combination of absolute maximum ratings can be attained simultaneously. The maximum ratings designate the maximum of the absolute value of that rating regardless of polarity.

Data provided under **typical operation** represent operating conditions within the maximum ratings that are suitable for a particular application but do not imply that

the product cannot be operated satisfactorily under other conditions in the same application.

The term **plate output power** is the calculated output power from the tube itself and is equal to plate input minus plate dissipation. The term **useful power output** is the output measured at the load and does not include power lost in the output circuit.

Information furnished in the catalog is believed to be accurate and reliable. More extensive data is available on individual types on request. Characteristics and operating values are based upon performance tests or calculated data. **These figures may change without notice as the result of additional data or product refinement. It is highly recommended that Varian Power Grid & X-Ray Tube Products be consulted before using this catalog information for the final equipment design.**

Tentative ratings and characteristics are identified so the user is alerted that possible changes may be made. Contact the Application Engineering Department at the appropriate plant prior to proceeding with a design.

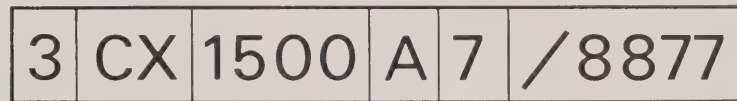
TUBE TYPE NUMBERING SYSTEM

EIMAC tube types are identified by either a non-descriptive, sequentially-assigned 4-digit type number, standardized and registered with the ELECTRONICS INDUSTRIES ASSOCIATION (EIA), for non-duplication throughout the world, or by a coded numbering system, designed to convey descriptive information about the tube. Many tube types can be identified with either number, and are branded with both.

In general, the EIMAC type number consists of: a numeral including the number of electrodes, one or more

letters denoting special characteristics, a numeral representing the plate dissipation rating, and a final letter to distinguish the tube from others which may bear similar or preceding letters and numerals. Triode types carry an additional number to indicate their approximate amplification factor.

To illustrate the system, a typical 1500-watt ceramic, external-anode, forced-air cooled EIMAC triode is broken down as follows:



Number of Electrodes

- 2 - Diode
- 3 - Triode
- 4 - Tetrode
- 5 - Pentode

Approximate Plate Dissipation (Watts)

Note: See K designation under version

Description

- C - Ceramic Envelope (No Glass)
- L - External Anode, Liquid Convection Cooling
- M - External Anode, Multiphase Cooling
- N - External Anode, Natural Convection Air Cooling
- P - Primarily for Pulse Applications
- *R - Internal Anode, Radiation Cooled
- **S - External Anode, Conduction Cooled
- V - External Anode, Vapor Cooled
- W - External Anode, Water Cooled
- X - External Anode, Forced-Air Cooled
- * - In older types, the dash, as in the case of the 4-250A, carries the meaning of "R" given above.

**This class of tubes may employ BeO (Beryllium Oxide) as a thermal link external to the vacuum envelope. NOTE: Some products carry type numbers which begin with X or Y. X designates a developmental tube type. Type numbers beginning with Y are special purpose tubes which may be variations of standard products. YC indicates a special tube made in San Carlos, CA. YU indicates a special tube made in Salt Lake City, UT.

Version

Distinguishes tubes which, although alike as to number of electrodes and plate dissipation, are not necessarily interchangeable physically or electrically. The letter "K" here is a 1000 multiplier for dissipation. Thus 4CPW1000KA is rated for one megawatt of plate dissipation.

EIA Type Number

Triode Amplification Factor

- 1-up to 9
- 2-10 to 19
- 3-20 to 29
- 4-30 to 49
- 5-50 to 99
- 6-100 to 199
- 7-200 to 499
- 8-500 to 999

EIMAC POWER GRID TUBE SELECTION GUIDE

The Power Grid Tube Selection Guide is arranged for ease in making type selections by use rather than tube type. The Guide is applications-oriented.

Tube types are listed according to the principal modes of service for which they are rated. Under each mode of service, EIMAC tube types suitable for application are tabulated in descending order of the most significant tube parameter in the left hand column. For example, in the POWER AMPLIFIER tabulations, tube types are listed in descending order of typical rf power output. The PULSE

REGULATOR tubes are listed in descending order of peak current capability. This format places emphasis on tube application and facilitates comparison in terms of the significant ratings of the EIMAC types available for a given application.

After preliminary selection of a tube type (or types) from the Guide, the final choice should be based upon the complete ratings from the data sheet for the tube in question and consultation with the Power Grid & X-Ray Tube Products Application Engineering Department.

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RADIO FREQUENCY POWER AMPLIFIER

LINEAR SERVICE

Peak Env. Power **	Rated Plate Diss. (kW-W)	Frequency * F1/ Upper Useful (MHz)	Inter-Mod. Distortion Typical #		Cooling	EIMAC Type Number	Tube Type
			3rd	5th			
			(-dB)	(-dB)			
1220 kW	1500 kW	30/100	-	-	water	8974	Tetrode
610 kW	400 kW	110/200	-	-	multi	4CM400,000A	Tetrode
610 kW	1000 kW	110/200	-	-	water	8973	Tetrode
300 kW	300 kW	30/110	-	-	multi	4CM300,000G	Tetrode
230 kW	250 kW	30/50	31	43	vapor	4CV250,000B	Tetrode
230 kW	250 kW	30/50	31	43	water	4CW250,000B	Tetrode
168 kW	150 kW	108/150	-	-	water	4CW150,000E	Tetrode
168 kW	100 kW	108/150	-	-	water	4CW100,000E	Tetrode
123 kW	100 kW	30/50	26	40	vapor	4CV100,000C/8351	Tetrode
55 kW	35 kW	30/50	30	40	air	4CX35,000C/8349	Tetrode
50 kW	40 kW	110/ -	35	40	air	4CX40,000GM	Tetrode
45 kW	50 kW	110/200	46	60	vapor	4CV50,000J	Tetrode
45 kW	50 kW	110/200	46	60	water	4CW50,000J	Tetrode
33 kW	30 kW	230/ -	-	-	air	4CX40,000GM	Tetrode ##
29.6 kW	30 kW	110/ -	-	-	water	3CW30,000A7	Triode ##
28.5 kW	25 kW	110/220	-	-	water	4CW25,000B	Tetrode
27.5 kW	20 kW	110/220	-	-	air	3CX20,000A7	Triode ##
24 kW	15 kW	110/220	40	39	air	3CX15,000A7	Triode ##
20 kW	20 kW	30/ -	-	-	air	4CX20,000B	Tetrode
17 kW	20 kW	140/220	40	39	water	3CW20,000A7	Triode ##
17 kW	10 kW	140/220	40	39	air	3CX10,000A7/8160	Triode ##
16.5 kW	15 kW	230/ -	-	-	air	4CX15,000R	Tetrode
14 kW	15 kW	150/ -	-	-	air	3CX15,000B7	Triode ##
12 kW	15 kW	110/220	41	41	air	4CX15,000J/8910	Tetrode
10.5 kW	10 kW	100/220	35	40	air	4CX10,000J	Tetrode
10 kW	10 kW	150/ -	-	-	air	3CX10,000B7	Triode ##
10 kW	12 kW	110/ -	-	-	water	4CW10,000B	Tetrode
10 kW ¶¶	10 kW	250/ -	35	43	air	3CX10,000U7 ¶	Triode ##
10 kW	10 kW	110/ -	35	43	air	3CX10,000B7	Triode ##
10 kW	6 kW	110/ -	-	-	air	3CX4500C7/YU-148	Triode ##
10 kW	7.5 kW	110/220	32	44	air	4CX7500A ¶	Tetrode
10 kW	5 kW	100/220	30	38	air	4CX5000R/8170W	Tetrode
5.8 kW	3 kW	150/220	40	43	air	5CX3000A/8966	Pentode
5.5 kW	3 kW	110/ -	51	45	air	3CX3000A7	Triode ##
5.3 kW	3 kW	150/220	35	40	air	4CX3000A/8169	Tetrode
5.0 kW	5 kW	150/ -	35	45	air	3CX5000A7	Triode ##
3.3 kW	5 kW	100/220	41	44	air	4CX5000J/8909	Tetrode
3.0 kW	4.5 kW	1000/ -	-	-	air	Y-834	Tetrode

* F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate input power.

** Plate power output, calculated or measured at low frequency.

Calculated or measured by two-tone method at 2.0 MHz.

Cathode driven.

§ VHF-TV.

§§ LPTV and translator service.

¶ Cavity assemblies for various frequencies available from Varian Power Grid & X-ray Tube Products. See CAVITY section of this catalog.

¶¶ Peak of sync in TV service.

† Three-tone Inter-Modulation Distortion test.

RADIO FREQUENCY POWER AMPLIFIER

LINEAR SERVICE

Peak Env. Power ** Typical (kW-W)	Rated Plate Diss. (kW-W)	Frequency * F1/ Upper Useful (MHz)	Inter-Mod. Distortion Typical # 3rd 5th (-dB) (-dB)		Cooling	EIMAC Type Number	Tube Type
2.09 kW	1.5 kW	220/400	44	44	water	3CW2500C7/YU-157	Triode
2.06 kW	1 kW	220/400	31	39	air	3CX1000A7/8283	Triode ##
2.05 kW	1.5 kW	220/400	38	44	air	3CX1500A7/8877	Triode ##
2.03 kW	1.5 kW	500/ -	44	44	air	3CX1500C7/8938	Triode ##
1785 W	1500 W	110/220	33	42	air	5CX1500A	Pentode
1500 W	1200 W	110/ -	-	-	water	3CW1750A7	Triode ##
1500 W	1200 W	110/ -	-	-	air	3CX1200A7	Triode ##
1500 W	1200 W	110/ -	-	-	air	3CX1200D7/YU-121	Triode ##
1160 W	1500 W	110/220	43	47	air	4CX1500B/8660	Tetrode
1100 W	4500 W	1000/ -	-	-	air	Y-834 §§	Tetrode
1080 W	1000 W	110/ -	29	37	air	3-1000Z/8164	Triode ##
750 W	800 W	30/450	36	32	air	3CX800A7 ¶	Triode ##
740 W	500 W	110/ -	40	45	air	3-500Z	Triode ##
645 W	500 W	110/ -	33	41	air	5-500A	Pentode
590 W	200 W	500/900	35	36	cond	8873	Triode ##
590 W	400 W	500/900	35	36	air	3CX400A7/8874 ¶	Triode ##
590 W	300 W	500/900	35	36	air	8875	Triode ##
580 W	600 W	30/ -	43	43	air	4CX600J/8809	Tetrode
495 W	400 W	110/ -	35	36	air	4-400C/6775	Tetrode
350 W	350 W	500/ -	27	30	air	8930	Tetrode
295 W	250 W	500/ -	25	30	air	4CX250R/7580W	Tetrode
295 W	250 W	500/ -	25	30	cond	4CS250R	Tetrode
263 W	350 W	30/220	30	35	air	4CX350A/8321	Tetrode
263 W	350 W	30/220	30	35	air	4CX350F/8322	Tetrode
263 W	350 W	30/220	40	45	air	4CX350FJ/8904	Tetrode
200 W	1500 W	1500/ -	56	-	air	Y-831 §§ †	PI Triode
100 W	1000 W	1500/ -	56	-	air	Y-730 §§ †	PI Triode
100 W	150 W	3000/ -	52	-	air	Y-579A §§ †	PI Triode

* F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate input power.

** Plate power output, calculated or measured at low frequency.

Calculated or measured by two-tone method at 2.0 MHz.

Cathode driven.

§ VHF-TV.

§§ LPTV and translator service.

¶ Cavity assemblies for various frequencies available from Varian Power Grid & X-ray Tube Products. See CAVITY section of this catalog.

¶¶ Peak of sync in TV service.

† Three-tone Inter-Modulation Distortion test.

RADIO FREQUENCY POWER AMPLIFIER

CLASS C, CW OR FM SERVICE

Plate Pwr. Output Typical *	Rated Plate Diss.	Frequency # F1/ Upper Useful	Power Gain *	Cooling	EIMAC Type Number	Tube Type
(kW-W)	(kW-W)	(MHz)				
2800 kW	2500 kW	80/210	225	multi	4CM2500KG/X2274	Tetrode
2700 kW	1500 kW	30/100	200	water	8974	Tetrode
2600 kW	1400 kW	65/150	-	water	4CW1400KG/X2242	Tetrode
1050 kW	400 kW	110/210	300	water	8973	Tetrode
1050 kW	400 kW	110/210	300	multi	4CM400,000A	Tetrode
460 kW	250 kW	30/50	150	vapor	4CV250,000B	Tetrode
460 kW	250 kW	30/50	150	water	4CW250,000B	Tetrode
301 kW	300 kW	30/110	209	multi	4CM300,000G/9000	Tetrode
220 kW	150 kW	108/250	1800	water	4CW150,000E	Tetrode
220 kW	100 kW	108/250	1800	water	4CW100,000E	Tetrode ¶
168 kW	100 kW	30/50	1350	vapor	4CV100,000C/8351	Tetrode
165 kW	100 kW	30/50	140	water	4CW100,000D	Tetrode
137 kW	50 kW	110/220	900	vapor	4CV50,000E	Tetrode
137 kW	50 kW	110/220	900	water	4CW50,000E	Tetrode
110 kW	35 kW	30/50	425	air	4CX35,000C/8349	Tetrode
70 kW	100 kW	110/250	28	water	4CW100,000G	Tetrode
64 kW	20 kW	90/150	66	air	3CX20,000A3	Triode
64 kW	20 kW	90/150	66	air	3CX20,000H3	Triode
60 kW	40 kW	250/ -	200	air	4CX40,000G	Tetrode ¶
60 kW	40 kW	90/ -	75	water	3CW40,000A5	Triode
38 kW	20 kW	110/220	170	air	4CX20,000A/8990	Tetrode ¶
36.5 kW	15 kW	110/225	166	air	4CX15,000A/8281	Tetrode
36.5 kW	25 kW	110/ -	160	water	4CW25,000B	Tetrode
35 kW	20 kW	30/ -	80	air	4CX20,000B	Tetrode
35 kW	20 kW	110/ -	80	air	4CX20,000C	Tetrode ¶
30 kW	15 kW	100/150	45	air	3CX15,000A3	Triode
25 kW	15 kW	110/160	20	air	3CX15,000A7	Triode **
24.5 kW	10 kW	140/200	6	air	3CX10,000A3	Triode **
24.5 kW	20 kW	140/200	6	water	3CW20,000A3	Triode **
22.5 kW	10 kW	160/ -	20	air	3CX10,000A7	Triode **
21.3 kW	30 kW	110/ -	16	water	3CW30,000A7	Triode **
20 kW	12 kW	220/ -	66	air	4CX12,000A/8989	Tetrode ¶
16 kW	25 kW	220/ -	33	air	4CX25,000A	Tetrode ¶ **
16 kW	5 kW	100/220	100	air	4CX5000A/8170	Tetrode
16 kW	10 kW	100/220	100	air	4CX10,000D/8171	Tetrode
16 kW	10 kW	100/220	100	water	4CW10,000A	Tetrode
16 kW	5 kW	100/220	100	air	4CX5000R/8170W	Tetrode
11 kW	3 kW	30/100	260	air	4CX3000A/8169	Tetrode
10 kW	6 kW	110/ -	15	air	3CX6000A7/YU-148	Triode
10 kW	4 kW	75/150	73	air	3CX2500A3/8161	Triode
10 kW	4 kW	75/150	73	air	3CX2500F3/8251	Triode

* Power output and power gain do not include circuit losses and are calculated or measured at low frequency (Power Gain = Plate Power Output/Driving Power).

** Cathode Driven.

F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced anode voltage and reduced plate input power.

900 MHz.

\$ Power output shown is measured useful, delivered to load, at 104 MHz.

\$\$ Useful power output, measured at 430 MHz.

¶ Cavity assemblies for various frequencies available from Varian Power Grid & X-ray Tube Products. See CAVITY section of this catalog.

RADIO FREQUENCY POWER AMPLIFIER

CLASS C, CW OR FM SERVICE

Plate Pwr. Output Typical * (kW-W)	Rated Plate Diss. (kW-W)	Frequency # F1/ Upper Useful (MHz)	Power Gain * Gain *	Cooling	EIMAC Type Number	Tube Type
10 kW	4 kW	75/150	73	air	3CX2500F3/8251	Triode
10 kW	5 kW	75/150	73	water	3CW5000A3/8242	Triode
10 kW	5 kW	75/150	73	water	3CW5000F3/8243	Triode
10 kW	7.5 kW	100/220	100	air	4CX7500A	Tetrode ¶
8.5 kW	3 kW	150/200	160	air	5CX3000A	Pentode
5 kW	3.5 kW	100/200	75	air	4CX3500A	Tetrode ¶
3.4 kW	1 kW	110/ -	225	air	4-1000A/8166	Tetrode
3.2 kW	1.5 kW	110/220	350	air	4CX1500A	Tetrode
3.18 kW	1.5 kW	110/220	350	air	5CX1500A	Pentode
3.0 kW	4.5 kW	1000/ -	-	air	Y-834	Tetrode
2.6 kW §	1.5 kW	250/ -	33	air	3CX1500A7/8877	Triode **
1.5 kW §§	1.5 kW	500/ -	30	air	3CX1500C7/8938	Triode **
1.5 kW	2.0 kW	110/ -	-	water	3CW1750A7	Triode
1300 W	1.2 kW	110/ -	48	air	3CX1200A7	Triode
1300 W	800 W	110/ -	48	air	3CX1200D7/YU-121	Triode
1300 W	500 W	110/ -	93	air	5-500A	Pentode
1265 W	500 W	110/ -	140	air	4-500A	Tetrode
1100 W	400 W	110/ -	190	air	4-400C	Tetrode
840 W	350 W	100/150	31	air	5867A	Triode
750 W	800 W	350/450	35	air	3CX800A7	Triode ** ¶
805 W	500 W	110/ -	110	air	4-500A/4-500B	Tetrode
600 W	300 W	110/220	158	air	4CX300Y	Tetrode
500 W	300 W	500/ -	177	air	4CX300A	Tetrode
450 W	350 W	500/ -	190	air	8930	Tetrode
380 W	250 W	500/ -	190	cond	4CS250R	Tetrode
380 W	250 W	500/ -	130	air	4CX250B/7203	Tetrode
380 W	250 W	500/ -	130	air	4CX250FG/8621	Tetrode
380 W	250 W	500/1500	130	air	4CX250K/8245	Tetrode
380 W	250 W	500/1500	130	air	4CX250M/8246	Tetrode
380 W	250 W	500/ -	190	air	4CX250R/7580W	Tetrode
380 W	250 W	150/500	130	air	4X150A/7034	Tetrode
380 W	250 W	150/500	130	air	7609	Tetrode
350 W	800 W	1000/ -	35	air	3CX800U7	Triode ** ¶
375 W	125 W	120/ -	150	air	4-125A/4D21	Tetrode
320 W	200 W	500/ -	35	cond	8873	Triode **
320 W	400 W	500/ -	35	air	3CX400A7/8874	Triode ** ¶
320 W	300 W	500/ -	35	air	8875	Triode **
300 W	600 W	1000/ -	32	air	3CX600U7	Triode **
270 W	65 W	150/ -	160	conv	4-65A	Tetrode
216 W	400 W	1000/ -	11.5	air	3CX400U7	Triode ** ¶

* Power output and power gain do not include circuit losses and are calculated or measured at low frequency (Power Gain = Plate Power Output/Driving Power).

** Cathode Driven.

F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced anode voltage and reduced plate input power.

900 MHz.

§ Power output shown is measured useful, delivered to load, at 104 MHz.

§§ Useful power output, measured at 430 MHz.

¶ Cavity assemblies for various frequencies available from Varian Power Grid & X-ray Tube Products. See CAVITY section of this catalog.

RADIO FREQUENCY POWER AMPLIFIER

CLASS C - PLATE MODULATED SERVICE

Carrier Pwr. Output Typical * (kW-W)	Plate Diss. at Typical Conditions (kW-W)	Frequency # F1/ Upper Useful (MHz)	Power Gain * Gain *	Cooling	EIMAC Type Number	Tube Type
1375 kW	300 kW	30/100	200	water	8974	Tetrode
700 kW	175 kW	110/200	290	water	8973	Tetrode
700 kW	175 kW	110/200	290	multi	4CM400,000A/AG	Tetrode
300 kW	85 kW	30/110	210	multi	4CM300,000G	Tetrode
285 kW	119 kW	30/50	120	vapor	4CV250,000B	Tetrode
285 kW	119 kW	30/50	120	water	4CW250,000B	Tetrode
140 kW	35 kW	108/150	260	water	4CW150,000E	Tetrode
140 kW	47 kW	30/50	110	vapor	4CV100,000C/8351	Tetrode
140 kW	35 kW	108/150	260	water	4CW100,000E	Tetrode
138 kW	22 kW	30/50	160	water	4CW100,000D	Tetrode
110 kW	22 kW	110/220	160	water	4CW50,000E	Tetrode
110 kW	22 kW	110/220	160	vapor	4CV50,000E	Tetrode
55 kW	13 kW	30/50	440	air	4CX35,000C/8349	Tetrode
29 kW	7 kW	30/ -	800	air	4CX20,000B	Tetrode
27.5 kW	7.5 kW	90/150	18	air	3CX20,000A3	Triode
27.5 kW	7.5 kW	90/150	18	air	3CX20,000H3	Triode
23.5 kW	5.8 kW	110/ -	155	water	4CW25,000B	Tetrode
23.5 kW	5.8 kW	110/225	155	air	4CX15,000A/8281	Tetrode
23.5 kW	5.8 kW	110/225	155	vapor	4CV35,000A	Tetrode
18 kW	5.4 kW	100/150	37	air	3CX15,000A3	Triode
12.4 kW	2.6 kW	140/200	24	air	3CX10,000A3/8159	Triode
5.8 kW	3.5 kW	100/220	230	air	4CX10,000D/8171	Tetrode
5.8 kW	3.5 kW	100/220	230	air	4CX5000A/8170	Tetrode
5.8 kW	3.5 kW	100/220	230	air	4CX5000R/8170W	Tetrode
5.75 kW	1.25 kW	150/220	190	air	4CX3000A/8169	Tetrode
5.3 kW	950 W	75/150	45	air	3CX2500A3/8161	Triode
5.3 kW	950 W	75/150	45	air	3CX2500F3/8251	Triode
2.6 kW	670 W	110/ -	290	air	4-1000A/8166	Tetrode
2.3 kW	780 W	110/220	230	air	4CX1500A	Tetrode
1.96 kW	575 W	110/220	195	air	5CX1500A	Pentode
1.76 kW	485 W	110/ -	50	air	3-1000Z/8164	Triode
1.76 kW	485 W	110/ -	50	air	3CX1200A7	Triode
830 W	245 W	110/ -	140	air	4-500A/4-500B	Tetrode
785 W	280 W	110/ -	110	air	5-500A	Pentode
640 W	185 W	110/ -	25	air	3-500Z	Triode
630 W	195 W	110/ -	190	air	4-400C/6775	Tetrode
300 W	80 W	120/ -	90	air	4-125A/4D21	Tetrode
300 W	200 W	110/220	175	air	4CX300Y/8561	Tetrode
270 W	280 W	500/ -	160	air	8930	Tetrode
235 W	65 W	500/ -	160	cond	4CS250R	Tetrode
235 W	65 W	500/ -	135	air	4CX250BC/8957	Tetrode
235 W	65 W	500/1500	135	air	4CX250K/8245	Tetrode

* Power output and power gain do not include circuit losses and are calculated or measured at low frequency (Power Gain = Plate Power Output/Driving Power).

F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced anode voltage and reduced plate input power.

RADIO FREQUENCY POWER AMPLIFIER

CLASS C - PLATE MODULATED SERVICE

Carrier Pwr. Output Typical * (kW-W)	Plate Diss. at Typical Conditions (kW-W)	Frequency # F1/ Upper Useful (MHz)	Power Gain * Cooling	EIMAC Type Number	Tube Type	
235 W	65 W	500/1500	135	air	4CX250M/8246	Tetrode
235 W	65 W	500/ -	160	air	4CX250R/7580W	Tetrode
235 W	65 W	500/ -	135	air	4CX300A/8167	Tetrode
235 W	65 W	150/500	135	air	4X150A/7034	Tetrode
235 W	65 W	150/500	135	air	7609	Tetrode
210 W	45 W	150/ -	65	conv	4-65A/8165	Tetrode

* Power output and power gain do not include circuit losses and are calculated or measured at low frequency (Power Gain = Plate Power Output/Driving Power).

F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced anode voltage and reduced plate input power.

RADIO FREQUENCY INDUSTRIAL SERVICE

CLASS C - OSCILLATOR OR AMPLIFIER

Plate pwr. Output Typical # (kW-W)	Rated Plate Diss. (kW-W)	Filament Heating Power (Watts)	Frequency * F1/ Upper Useful (MHz)	Cooling	EIMAC Type Number	Tube Type
1600 kW	1500 kW	23625	30/60	water	8972	Triode
175 kW	100 kW	3120	30/ -	water	3CW150,000H3	Triode
100 kW	45 kW	1600	75/ -	water	3CW45,000H3	Triode
70 kW	40 kW	1600	90/ -	water	3CW40,000H3	Triode
60 kW	20 kW	1600	90/ -	air	3CX20,000H3	Triode
42 kW	30 kW	1020	90/ -	water	3CW30,000H3	Triode
42 kW	30 kW	1020	100/ -	vapor	3CV30,000H3	Triode
41 kW	15 kW	1020	90/ -	air	3CX15,000H3	Triode
29 kW	10 kW	742	90/ -	air	3CX10,000H3	Triode
28 kW	20 kW	742	90/ -	water	3CW20,000H3	Triode
20.6 kW	10 kW	566	90/ -	water	3CW10,000H3	Triode
18.6 kW	5 kW	566	90/ -	air	3CX5000H3	Triode
15 kW	7 kW	585	110/ -	water	3CW7000H3/Y-842A	Triode
10 kW	6 kW	550	110/ -	air	3CX4500F3/YU-108	Triode
10 kW	5 kW	379	75/150	water	3CW5000H3	Triode
5 kW	2.5 kW	379	75/150	air	3CX2500A3/8161	Triode
5 kW	2.5 kW	379	75/150	air	3CX2500F3/8251	Triode
5 kW	2.5 kW	379	75/150	air	3CX2500H3	Triode
5 kW	2.5 kW	232	100/ -	air	3CX2500D3	Triode
3 kW	1.5 kW	158	110/ -	air	3CX1500D3	Triode
3 kW	3 kW	135	110/ -	water	3CW2000D3	Triode
5 kW	2 kW	233	110/ -	water	3CW2500D3	Triode
2 kW	1.0 kW	150	100/ -	air	3-1000H	Triode
3 kW	1.5 kW	158	100/ -	air	3CX1500D3	Triode
1.2 kW	300 W	125	40/80	air	304TL	Triode
1 kW	500 W	70	100/ -	air	Y-837	Triode
680 W	350 W	70	100/ -	air	5867A	Triode

* F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate input power.

Plate power output, calculated or measured at low frequency.

REGULATOR SERVICE

VOLTAGE OR CURRENT

Maximum Pass Current (A dc)	Maximum Hold-off Voltage * (kVdc)	Minimum Tube Drop (Vdc)	Rated Plate Diss. (kW-W)	Cooling	EIMAC Type Number	Tube Type
300	50 kV	3000	1500 kW	water	8974	Tetrode
150	50 kV	2500	1000 kW	water	8973	Tetrode
80	150 kV §	2000	1000 kW	water	4CPW1000KA/9009	Tetrode
80	100 kV §	2000	300 kW	water	4CPW300KA/9008	Tetrode
60	175 kV §	2000	1000 kW	water	4CPW1000KB/X-2062M	Tetrode
60	40 kV	2500	250 kW	water	4CW250,000B	Tetrode
35	110 kV §	2700	100 kW	water	4CPW100KA/Y-841	Tetrode
35	40 kV	2700	150 kW	water	4CW150,000E	Tetrode
35	40 kV	2700	100 kW	water	4CW100,000E	Tetrode
30	40 kV	3300	100 kW	water	4CW100,000D	Tetrode
15	35 kV	3000	50 kW	water	4CW50,000E	Tetrode
15	40 kV	2200	35 kW	air	4CX35,000C/8349	Tetrode
6	35 kV	2000	20 kW	air	4CX20,000B	Tetrode
5	10 kV	1200	20 kW	water	3CW20,000A7	Triode
5	10 kV	1300	12 kW	air	3CX10,000A1/8158	Triode
6	20 kV	800	25 kW	water	4CW25,000A	Tetrode
4	20 kV	500	15 kW	air	3CX15,000A7	Triode
4	25 kV	2000	10 kW	water	4CPW10,000R	Tetrode
4	15 kV	2000	10 kW	water	4CW10,000A/8661	Tetrode
3	12 kV	1300	5.0 kW	water	3CW5000A1	Triode
2	12 kV	1000	3.0 kW	air	3CX3000F1	Triode
1	8 kV	250	1.5 kW	oil or air	3CPX1500A7	Triode
1	6 kV	500	1.0 kW	air	4CX1000A/8168	Tetrode
1	6 kV	500	800 W	water	4CW800B	Tetrode
1	6 kV	500	800 W	water	4CW800F	Tetrode
1	50 kV	500	1000 W	air	8960	Tetrode
0.6	15 kV §	600	1000 W	oil or air	4CPL1000A	Tetrode
0.6	15 kV §	600	1000 W	oil or air	4CPL1000B	Tetrode
0.6	15 kV §	600	1000 W	oil or air	4CPL1000C	Tetrode
0.6	4.5 kV	300	800 W	air	3CPX800A7	Triode
0.6	30 kV	500	1000 W	air	4PR1000A/8189	Tetrode
0.6	6.5 kV	-	100 W	oil or air	8940/Y-789	Planar
0.6	15 kV §	-	600 W §	oil or air	8941/Y-690	Planar
0.6	12 kV §	-	600 W §	oil or air	8942/Y-678	Planar
0.6	30 kV §	-	400 W §	oil or air	Y-820	Planar
0.6	95 kV §	-	1000 W §	oil or air	Y-810	Planar
0.6	70 kV §	-	1000 W §	oil or air	Y-811	Planar
0.6	45 kV §	-	1000 W §	oil or air	Y-812	Planar
0.35	45 kV	400	800 W	air	Y-872	Triode
0.35	45 kV	400	1000 W	air	YU-164	Triode
0.35	30 kV	1800	800 W	air	YU-118	Tetrode

* Consult the Application Engineering Department at the appropriate plant for regulator range characteristics.

** Specially processed 4CX250B.

§ In insulating media

REGULATOR SERVICE

VOLTAGE OR CURRENT

Maximum Pass Current (Adc)	Maximum Hold-off Voltage * (kVdc)	Minimum Tube Drop (Vdc)	Rated Plate Diss. (kW-W)	Cooling	EIMAC Type Number	Tube Type
0.35	30 kV	1800	1000 W	air	YU-165	Tetrode
0.35	8 kV	400	500 W	air	3-500Z	Triode
0.35	3.5 kV	300	400 W	air	3CX400A7/8874	Triode
0.35	3.5 kV	300	300 W	air	8875	Triode
0.35	3.5 kV	300	200 W	cond	8873	Triode
0.25	6.0 kV	500	250 W	air	Y-867	Tetrode **
0.2	20 kV	1800	400 W	air	4PR400A/8188	Tetrode
0.2	25 kV	-	400 W	air	3PR400A7	Triode
0.2	50 kV	1000	250 W	air	4PR250C/8248	Tetrode
0.1	18 kV	1200	125 W	air	4PR125A/8247	Tetrode
0.1	15 kV	500	65 W	conv	4PR65A/8187	Tetrode

* Consult the Application Engineering Department at the appropriate plant for regulator range characteristics.

** Specially processed 4CX250B.

§ In insulating media

RADIO FREQUENCY POWER AMPLIFIER

PULSED SERVICE

PEAK RF PWR. OUT TYPICAL # (KW-W)	RATED PLATE DISS. (KW-W)	FREQUENCY * F1/ UPPER LOWER MHZ	MAXIMUM PLATE VOLTAGE (KVDC)	MAXIMUM PLATE # CURRENT (A)	COOLING	EIMAC TYPE NUMBER	TUBE TYPE
4500 kW	1500 kW	30/100	30	195	water	8974	Tetrode
2600 kW	1400 kW	200	27	190	water	4CW1400KG/X2242	Tetrode
2000 kW	1000 kW	110/200	30	100	water	8973	Tetrode
2000 kW	1000 kW	110/200	30	100	water	4CM400,000A	Tetrode
1000 kW	300 kW	30/110	25	60	multi	4CM300,000G	Tetrode
600 kW	150 kW	108/150	30	30	water	4CW150,000E	Tetrode
600 kW	100 kW	108/150	30	30	water	4CW100,000E	Tetrode
400 kW	50 kW	110/220	30	25	vapor	4CV50,000E	Tetrode
400 kW	50 kW	110/220	30	25	water	4CW50,000E	Tetrode
150 kW	20 kW	30/ -	18	20	air	4CX20,000B	Tetrode
120 kW	40 kW	250/ -	15	15	air	4CX40,000G	Tetrode
120 kW	15 kW	110/225	10	20	air	4CX15,000A/8281	Tetrode
100 kW	12 kW	220/ -	12	16	air	4CX12,000A/8989	Tetrode
80 kW	10 kW	110/220	10	13	air	4CX10,000D/8171	Tetrode
80 kW	7.5 kW	220/ -	8	16	air	4CX7500A	Tetrode
80 kW	5 kW	110/220	10	13	air	4CX5000A/8170	Tetrode
80 kW	5 kW	110/220	10	13	air	4CX5000R/8170W	Tetrode
60 kW	15 kW	110/ -	7	20	air	3CX15,000B7	Triode §
60 kW	5 kW	110/ -	7	20	air	3CPX5000A7	Triode § ¶
40 kW	10 kW	250/500	7	10	air	3CX10,000U7	Triode § ¶
40 kW	10 kW	110/ -	7	15	air	3CX10,000B7	Triode §
40 kW	1.2 kW	110/ -	50	12	air	8960	Tetrode
40 kW	3.5 kW	250/500	7	10	air	3CPX3500U7	Triode §
34 kW	1.0 kW	110/ -	15	3.5	air	4PR1000A/8189	Tetrode
30 kW	5 kW	110/ -	7	7.5	air	3CX5000A7	Triode §
28 kW	250 W	500/1500	7	6	air	4CPX250K/8590	Tetrode ##
28 kW	250 W	500/1500	7	6	air	4CX250K/8245	Tetrode ##
28 kW	250 W	500/1500	7	6	air	4CX250M/8246	Tetrode ##
26 kW	1500 W	500/ -	5	8	air	3CX1500C7/8938	Triode §
11 kW	400 W	110/ -	10	1.7	air	4PR400A/8188	Tetrode
10 kW	250 W	500/1500	5.5	0.8	air	4CPX250K/8590	Tetrode
10 kW	600 W	1500/ -	8	0.6	air	Y-739F	Triode
6 kW	800 W	350/500	3.5	2.5	air	3CPX800A7	Triode § ¶
4.0 kW	125 W	120/ -	9	0.7	air	4PR125A/8247	Tetrode
4.0 kW	800 W	500/930	2.5	2.5	air	3CX800U7	Triode § ¶
2.6 kW	300 W	110/220	3	1.3	air	4CX300Y/8561	Tetrode
2.0 kW	65 W	150/ -	7.5	0.4	conv	4PR65A/8187	Tetrode
1.6 kW	200 W	500/ -	3	0.8	cond	8873	Triode §
1.6 kW	400 W	500/ -	3	0.8	air	3CX400A7/8874	Triode § ¶
1.6 kW	300 W	500/ -	3	0.8	air	8875	Triode §
1.6 kW	250 W	500/ -	3	0.8	air	4CX250B/7203	Tetrode
1.6 kW	250 W	500/ -	3	0.8	air	4CX250FG/8621	Tetrode
1.6 kW	250 W	500/1500	3	0.8	air	4CX250K/8245	Tetrode
1.6 kW	250 W	500/1500	3	0.8	air	4CX250M/8246	Tetrode

* F1 is the maximum frequency at which maximum ratings apply. Operation at the upper useful frequency normally involves operation at reduced plate voltage and reduced plate power input.

Average during the pulse. Power output data is plate power (does not include circuit losses), calculated or measured at low frequency. Derating due to pulse duration vs duty cycle is necessary.

Plate and screen grid pulsed.

§ Cathode driven.

¶ Cavity assemblies for various frequencies available from Varian Power Grid & X-ray Tube Products. See CAVITY section of this catalog.

TELEVISION SERVICE

TELEVISION SERVICE

Peak Sync Pwr Output (kW)	USA Band	Europe Band	EIMAC Cavity Type	Peak Sync Drive Pwr (W)	EIMAC TUBE	TUBE TYPE
60	UHF Band	IV, V	CV5000/1	300	2KDW60LA/LF	Klystrode®
30*	UHF Band	IV, V	CV5100/1	150	2KDX40LA/LF	Klystrode
30	VHF Low Band	I	--	1000	4CX25,000A	Tetrode
30	VHF High Band	III	--	1000	4CX25,000A	Tetrode
40	UHF Band	IV, V	CV5100/1	200	2KDX40LA/LF	Klystrode
15	UHF Band	IV, V	CV5100/1	75	2KDX15LA/LF	Klystrode
13	VHF High Band	III	--	455	Y-863	Tetrode
10*	UHF Band	IV, V	CV5100/1	50	2KDX15LA/LF	Klystrode
10	VHF Low Band	I	CV2240B	390	3CX10,000U7	Triode
10	VHF High Band	III	CV2250B	335	3CX10,000U7	Triode
2.5*	VHF Low Band	I	CV2240B	80	3CX10,000U7	Triode
2.5*	VHF High Band	III	CV2250B	95	3CX10,000U7	Triode

* Power output in combined visual and aural service. Peak sync power in excess of these levels may be attained with exciter pre-correction.

AUDIO FREQUENCY

AUDIO FREQUENCY POWER AMPLIFIER

AF Pwr. Output Typical (2 tubes) (kW-W)	Plate Diss. at Typical Conditions Per Tube (kW-W)	Class of Service	Driving Power (2 tubes) (W)	Cooling	EIMAC Type Number	Tube Type
1900 kW	420 kW	AB1	0	water	8974	Tetrode
950 kW	210 kW	AB1	0	water	8973	Tetrode
660 kW	260 kW	AB1	0	vapor	4CV250,000B	Tetrode
660 kW	260 kW	AB1	0	water	4CW250,000B	Tetrode
246 kW	57 kW	AB1	0	vapor	4CV100,000C	Tetrode
246 kW	57 kW	AB1	0	water	4CX100,000D	Tetrode
200 kW	46 kW	AB1	0	water	4CW100,000E	Tetrode
195 kW	42 kW	AB1	0	water	4CW50,000E	Tetrode
195 kW	42 kW	AB1	0	vapor	4CV50,000E	Tetrode
195 kW	42 kW	AB1	0	vapor	4CV50,000J	Tetrode
195 kW	42 kW	AB1	0	water	4CW50,000J	Tetrode
70 kW	20 kW	AB1	0	air	4CX35,000C	Tetrode
66 kW	20.5 kW	AB1	0	vapor	4CV35,000A	Tetrode
57 kW	14 kW	AB1	0	water	4CW25,000A	Tetrode
57 kW	14 kW	AB1	0	air	4CX15,000A	Tetrode
31.9 kW	9 kW	AB1	0	air	4CX10,000D	Tetrode
29.1 kW	10 kW	AB1	0	air	3CX10,000A1	Triode
29.1 kW	10 kW	AB1	0	water	3CW20,000A1	Triode
17.5 kW	4.20 kW	AB1	0	air	4CX5000A	Tetrode
17.5 kW	4.20 kW	AB1	0	air	4CX5000R	Tetrode
14.5 kW	4.75 kW	AB1	0	vapor	4CV8000A	Tetrode
13.0 kW	2.50 kW	AB2	113	water	3CW5000A3/F3	Triode
13.0 kW	2.50 kW	AB2	113	air	3CX2500A3/F3	Triode
11.4 kW	3.30 kW	AB1	0	air	4CX3000A	Tetrode
10.0 kW	2.95 kW	AB1	0	water	3CW5000A1/F1	Triode
10.0 kW	2.95 kW	AB1	0	air	3CX3000A1/F1	Triode
3.90 kW	900 kW	AB2	4.7	air	4-1000A	Tetrode
3.22 kW	920 kW	AB1	0	air	5CX1500A	Pentode
3.20 kW	920 kW	AB1	0	air	4CX1500A	Tetrode
1.72 kW	500 kW	AB1	0	air	4-500A	Tetrode
1.66 kW	458 kW	AB1	0	air	5-500A	Pentode
1.75 kW	400 kW	AB2	3.5	air	4-400C	Tetrode
1.42 kW	445 kW	AB2	25	air	3-500Z	Triode
1.31 kW	340 kW	AB2	26	air	3-400Z	Triode
1.04 kW	190 kW	AB2	1.9	air	4-250A	Tetrode
800 W	225 kW	AB1	0	air	4CX300A	Tetrode
780 W	350 kW	AB1	0	air	8930	Tetrode
600 W	200 W	AB1	0	air	4CX250BC	Tetrode
					4CX250F	
					4X150A	
400 W	125 W	AB2	1.0	air	7609	Tetrode
270 W	63 W	AB2	1.3	convection	4-125A	Tetrode
					4-65A	Tetrode

SWITCH TUBE OR PULSED REGULATOR SERVICE

Peak Plate Current ¹ (amperes)	Maximum Hold-off Voltage (kVdc)	Rated Plate Diss. ¹ (kW-W)	Cooling	EIMAC Type Number	Tube Type
780	60	1500 kW	water	8974	Tetrode
400	60	1000 kW	water	8973	Tetrode
250	40	250 kW	water	4CW250,000B	Tetrode
150	150 §	1000 kW	water	4CPW1000KA/9009	Tetrode
150	100 §	300 kW	water	4CPW300,000A/9008	Tetrode
115	40	150 kW	water	4CW150,000E	Tetrode
115	75 §	100 kW	water	9013/Y-676A	Tetrode
100	175 §	1000 kW	water	4CPW1000KB/X-2062M	Tetrode
100	110 §	100 kW	water	4CPW100KA/Y-841	Tetrode
100	60	35 kW	air	Y-546	Tetrode *
100	60	100 kW	water	Y-647	Tetrode **
100	40	100 kW	water	4CW100,000D	Tetrode
100	40	35 kW	air	4CX35,000C/8349	Tetrode
90	35	50 kW	water	4CW50,000E	Tetrode
90	35	50 kW	vapor	4CV50,000E	Tetrode
67.5	13	5 kW	air	3CPX5000A7	Triode
60	25	30 kW	water	4CW30,000A	Tetrode
60	35	20 kW	air	4CX20,000B	Tetrode
54	12	10 kW	air	3CX10,000B7	Triode
50	20	25 kW	water	4CW25,000A	Tetrode
50	20	15 kW	air	4CX15,000A/8281	Tetrode
50	30	25 kW	water	Y-569	Tetrode ##
50	30	2.5 kW	oil	Y-870	Triode
50	15 §	1.5 kW	air or oil	3CPX1500A7	Triode
40	15	10 kW	air	4CX10,000D/8171	Tetrode
40	20	20 kW	water	3CW20,000A7	Triode
40	15	5 kW	air	4CX5000A/8170	Tetrode
40	15	5 kW	air	4CX5000R/8170W	Tetrode
30	25	10 kW	water	4CPW10,000R	Tetrode §§
27	12	5 kW	air	3CX5000A7	Triode
25	20	3 kW	air	4CX3000A/8169	Tetrode
18	20	60 W	air	4PR60C/8252W	Tetrode
15	15	4 kW	air	3CX3000A7	Triode
15	15	4 kW	air	3CX3000F7/8162	Triode
12	25 §	400 W	oil	Y-820	Planar
12	15	750 W	air	8941	Planar
12	8	750 W	air	8942	Planar
12	4	750 W	air	8940	Planar
12	4	600 W	air	4CX600F	Tetrode
12	4	800 W	water	4CW800B	Tetrode
12	4	800 W	water	4CW800F	Tetrode
10	50	1.0 kW	air	8960	Tetrode
10	7	1.5 kW	air	4CX1500A	Tetrode

¹ Contact Varian Power Grid & X-ray Tube Products Application Engineering at the plant of manufacture for peak pulse ratings.

* Specially processed 4CX35,000C

** Specially processed 4CW100,000D

Specially processed 4CW25,000B

§§ Previously designated as Y-442

¶ Specially processed 4PR1000A

¶¶ Specially processed 3-400Z

§ In insulating media

SWITCH TUBE OR PULSED REGULATOR SERVICE

Peak Plate ¹ Current (amperes)	Maximum Hold-off Voltage (kVdc)	Rated Plate Diss. ¹ (kW-W)	Cooling	EIMAC Type Number	Tube Type
10	85 §	1.0 kW	oil	Y-810	Planar
10	65 §	1.0 kW	oil	Y-811	Planar
10	40 §	1.0 kW	oil	Y-812	Planar
10	95 §	§ 1.0 kW	air or oil	Y-810	Planar
10	70 §	§ 1.0 kW	air or oil	Y-811	Planar
10	45 §	§ 1.0 kW	air or oil	Y-812	Planar
8	15 §	1.0 kW	oil or air	4CPL1000A	Tetrode
8	15 §	1.0 kW	oil or air	4CPL1000B	Tetrode
8	15 §	1.0 kW	oil or air	4CPL1000C	Tetrode
8	30	1.0 kW	air	4PR1000A/8189	Tetrode
8	4.5	800 W	air	3CPX800A7	Triode
8	2.5	800 W	air	3CX800A7	Triode
6	12	150 W	air	Y-518	Planar
6	7	250 W	air	4CPX250K/8590	Tetrode
6	4	150 W	air	Y-519	Planar
5	12	150 W	air	Y-540	Planar
5	4	150 W	air	Y-483	Planar
5	3.5	100 W	air	7211	Planar
4	50	250 W	air	4PR250C/8248	Tetrode
4	25	400 W	air	3PR400A7	Triode
4	20	400 W	air	4PR400A/8188	Tetrode
3.6	30	800 W	air	4X600/YU-118	Tetrode
3.6	30	1000 W	air	YU-165	Tetrode
3.6	45	600 W	air	3X600/Y-872	Triode
3.6	45	1000 W	air	YU-164	Triode
3	10	400 W	air	Y-504	Triode ¶¶
2.1	18	125 W	air	4PR125A/8247	Tetrode
1.5	4.5	100 W	air	8745	Planar
1.2	15	65 W	conv	4PR65A/8187	Tetrode

¹ Contact Varian Power Grid & X-ray Tube Products Application Engineering at the plant of manufacture for peak pulse ratings.

¶¶ Specially processed 3-400Z
§ In insulating media

Eimac Power Grid Tubes and Accessories

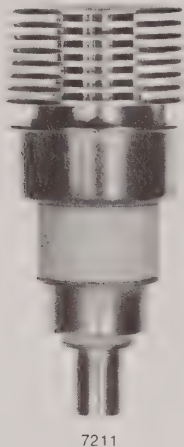


EIMAC PLANAR TRIODES

EIMAC planar triodes provide greater power, higher efficiency and more reliability than "standard" designs. Many EIMAC planars include internal shielding to reduce degradation effects caused by cathode sublimation. Other types feature a cool cathode to provide long tube life. A broad choice of anodes is available for a wide selection of cooling techniques. High quality and rigid inspection of planars provide low failure rate and low cost per tube operating hour.

You are not limited by listed planar types. Varian Power Grid and X-Ray Tube Application Engineering Department is ready to help you design EIMAC planars into your equipment, or to propose new planar designs to glove-fit your requirements. Write for our planar triode brochure or contact the Product Manager, Varian Power Grid and X-ray Tube Products, 1678 South Pioneer Road, Salt Lake City Utah 84104. Phone: (801) 972-5000.

7211, 7698



7211



7698

These ceramic/metal planar UHF triodes feature a large cathode area and a long grid-plate ceramic insulator, resulting in higher current ratings and making them useful in pulse service and high altitude environments. Features are high μ , high transconductance, great mechanical strength, and an arc-resistant extended interface cathode to assure long and reliable life under adverse conditions.

The 7211 and 7698 are identical except for the installation for a 100-watt transverse cooler on the anode of the 7211, while the 7698 carries a knurled-knob assembly on its anode.

CHARACTERISTICS

Plate Dissipation (Max.) (7211)	100 watts
(7698)	10 watts
Grid Dissipation (Max.) (both types)	2 watts
Frequency for Max. Ratings (CW)	2500 MHz
(Pulsed)	3000 MHz
Cooling (7211)	Forced Air
(7698)	Conduction or Forced Air
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	8.0 pF
Grid-Plate	2.25 pF
Plate-Cathode	0.06 pF
Amplification Factor (μ)	80
Transconductance (S_m)	30 mmhos
Base	Special, Coaxial
Socket	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length: (both types)	2.70 in; 68.60 mm
Maximum Diameter: (7211)	1.27 in; 32.20 mm
(7698)	1.20 in; 30.50 mm
Weight (approximate): (7211)	2.2 oz; 63 gm
(7698)	1.6 oz; 48 gm
Operating Position (both types)	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μ s)	Output Power (watts)
C	RF Amplifier (gnd. grid) at 700 MHz	2500	0.150	630	0.140	—	—	45*
C	RF Oscillator (gnd. grid) at 2500 MHz	2500	0.150	1000	0.140	—	—	30*
C	Grid-pulsed Amp. or Osc. at 1100 MHz	2500	5.0 •	2200	2.5 •	0.002	3	2500†
C	Plate-pulsed Amp. or Osc. at 3000 MHz	3500	5.0 •	3500	4.8 •	0.0025	3	3000†

* Useful Power Output, delivered to the load.
† Useful Pulse Power, delivered to the load.
• Average during the pulse.

7855, 7855KAL, Y-503



ML 7855*

These ceramic/metal planar UHF triodes feature rugged design, high transconductance, and high μ , a frequency stable anode, and an arc-resistant cathode, all to assure stable operation under adverse conditions and minimize catastrophic failure due to an arc during circuit malfunction.

Test evaluation of the 7855KAL is based on the operating conditions found in commercial airborne applications, such as transponders, emphasizing cathode emission capability at reduced heater voltage and high-voltage holdoff.

The 7855 has a 100-watt transverse cooler, while the 7855KAL includes a knurled-knob anode assembly and is rated for lower plate dissipation.

The Y-503 is a 7855 with a threaded anode shank, to allow conduction, heat-sink, or liquid cooling.



ML 7855 KAL*



Y-503

CHARACTERISTICS

Plate Dissipation (Max.) (7855)	100 watts
(7855KAL)	10 watts
(Y-503)	Dependent on Cooling Technique
Grid Dissipation (Max.)	2 watts
Frequency for Max. Ratings (CW)	2500 MHz
(Pulsed)	3000 MHz
Cooling (7855)	Forced Air
(7855KAL)	Conduction or Forced Air
(Y-503)	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage (7855 & Y-503)	6.0 volts
(7855KAL)	5.7 volts
Current (7855 & Y-503)	1.0 ampere
(7855KAL)	0.95 ampere
Capacitances: Grid-Cathode	6.8 pF
Grid-Plate	2.5 pF
Plate-Cathode	0.035 pF
Amplification Factor (μ)	80
Transconductance (S_m)	25 mmhos
Base	Special, Coaxial
Socket	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length: (7855 & 7855KAL)	2.40 in; 60.96 mm
(Y-503)	1.81 in; 45.97 mm
Maximum Diameter: (7855)	1.27 in; 32.20 mm
(7855KAL)	1.20 in; 30.50 mm
(Y-503)	0.79 in; 20.00 mm
Weight (approximate): (7855)	2.0 oz; 57 gm
(7855KAL)	1.4 oz; 40 gm
(Y-503)	0.65 oz; 18 gm
Operating Position (all types)	Any

* May not be equivalent to EIMAC tubes in all circuits.

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μ s)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1100 MHz	2500	3.0 •	2000	1.3 •	0.001	0.5	750*
C	Plate-pulsed Amplifier or Oscillator	3500	3.0 •	—	—	—	—	—

* Useful Power Output, delivered to the load.

• Average during the pulse.

8755



The 8755 is a miniature ceramic/metal rugged planar triode for advanced airborne and space applications up to 3000 MHz.

The tube is intended for use as an amplifier, oscillator, or frequency multiplier, either grid or plate-pulsed, and may also be used in modulator or regulator service. It has a frequency-stable anode design and an arc-resistant cathode to assure stable and reliable life under adverse conditions.

The tube is supplied without radiator, and may be conduction, convection, heat-sink, or liquid cooled. Radiators for forced-air cooling, permitting up to 150 watts of dissipation, are available.

CHARACTERISTICS

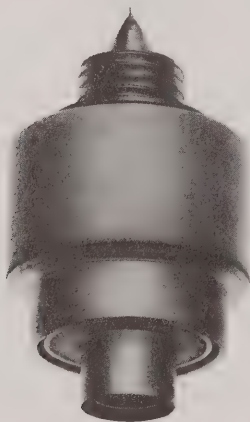
Plate Dissipation (Max.)	Dependent on Cooling Technique
Grid Dissipation (Max.)	1.5 watts
Frequency for Max. Ratings (CW)	2500 MHz
(Pulsed)	3000 MHz
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	9.5 pF
Grid-Plate	1.05 pF
Plate-Cathode	0.06 pF
Amplification Factor (Mu)	135
Nominal Cutoff Amp. Factor (Mu)	90
Transconductance (Sm)	30 mmhos
Anode	Threaded stud, 3/8-24 UNF, for heat transfer; Concentric flange for electrical contact.
Base	Special, Coaxial
Socket	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	1.37 in; 34.80 mm
Maximum Diameter:	0.785 in; 19.94 mm
Weight (approximate)	0.56 oz; 16 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator	8,000	5.0 •	1750	1.0 •	0.001	3.5	650†
C	Plate-pulsed Amplifier or Oscillator	10,000	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	8,000	5.0 •	—	—	—	—	—

† Useful Pulse Power, delivered to the load.

• Average during the pulse.

8757



The 8757 is a miniature, frequency-stable, ceramic/metal, rugged planar triode for advanced airborne and space applications up to 3500 MHz.

It may be used as an amplifier, oscillator, or frequency multiplier in the CW, grid or plate pulsed mode, as well as a modulator or regulator.

The tube has an anode designed to produce exceptional frequency stability, and an arc-resistant cathode, both assuring stable, reliable, and long-life operation under adverse conditions.

The 8757 is supplied without radiator and may be conduction, convection, heat-sink, or liquid cooled. Radiators for forced-air cooling, permitting an anode dissipation up to 150 watts, are available.

CHARACTERISTICS

Plate Dissipation (Max.)	Dependent on Cooling Technique
Grid Dissipation (Max.)	1.5 watts
Frequency for Max. Ratings (CW)	3000 MHz
(Pulsed)	3500 MHz
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	9.0 pF
Grid-Plate	1.65 pF
Plate-Cathode	0.04 pF
Amplification Factor (Mu)	75
Nominal Cutoff Amp. Factor (Mu)	60
Transconductance (Sm)	30 mmhos
Anode	Threaded stud, 3/8-24 UNF, for heat transfer; Concentric flange for electrical contact.
Base	Special, Coaxial
Socket	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	1.30 in; 33.00 mm
Maximum Diameter:	0.785 in; 19.94 mm
Weight (approximate)	0.56 oz; 16 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	RF Amplifier or Oscillator	2500	0.250	—	—	—	—	—
C	Grid-pulsed Amplifier or Oscillator at 3500 MHz	3000	5.0 •	2500	5.0 •	0.0033	1.0	3000†
C	Plate-pulsed Amplifier or Oscillator	3500	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	3500	5.0 •	—	—	—	—	—

† Useful Pulse Power, delivered to the load.

• Average during the pulse.



The tube is a frequency-stable anode design and has an arc-resistant cathode, for stable, reliable, and long-life operation under adverse conditions. It may be used as an amplifier, oscillator, or frequency multiplier, in the CW mode, or grid or plate pulsed, as well as a modulator or regulator.

Plate Dissipation (Max.)	Dependent on Cooling Technique
Grid Dissipation	1.5 watts
Frequency for Max. Ratings (CW)	3000 MHz
(Pulsed)	3500 MHz
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.0 volts
Current	0.95 ampere
Capacitances: Grid-Cathode	9.5 pF
Grid-Plate	1.4 pF
Plate-Cathode	0.06 pF
Amplification Factor (Mu)	75
Nominal Cutoff Amp. Factor (Mu)	60
Transconductance (Sm)	30 mmhos
Anode	Threaded stud, 3/8-24 UNF, for heat transfer; Concentric flange for electrical contact.
Base	Special, Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	1.37 in; 34.80 mm
Maximum Diameter:	0.785 in; 19.94 mm
Weight (approximate)	0.56 oz; 16 gm
Operating Position	Any

Class of Operation		MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μ s)	Output Power (watts)
C	RF Amplifier or Oscillator	2500	0.250	—	—	—	—	—
C	Grid-pulsed Amplifier or Oscillator at 1600 MHz	3000	5.0 •	3000	3.0 •	0.0033	6	3000†
C	Plate-pulsed Amplifier or Oscillator	3500	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	3500	5.0 •	—	—	—	—	—

- Average during the pulse.



The 8933/8538B is supplied without radiator and may be conduction, convection, heat-sink, or liquid cooled. Radiators for forced-air cooling, permitting an anode dissipation up to 150 watts, are available.

Plate Dissipation (Max.)	Dependent on Cooling Technique
Grid Dissipation (Max.)	1.5 watts
Frequency for Max. Ratings (CW)	2500 MHz
(Pulsed)	3000 MHz
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	1.3 amperes
Capacitances: Grid-Cathode	9.5 pF
Grid-Plate	1.4 pF
Plate-Cathode	0.06 pF
Amplification Factor (Mu)	120
Transconductance (Sm)	30 mmhos
Anode	Threaded stud, 5/16-24 UNF-2A thread for heat transfer; Concentric flange for electrical contact.
Base	Special, Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	1.50 in; 38.10 mm
Maximum Diameter:	0.95 in; 24.13 mm
Weight (approximate)	0.7 oz; 19 gm
Operating Position	Any

* May not be equivalent to EIMAC tubes in all circuits.

Class of Operation		MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μ s)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1030 MHz	8000	5.0 •	5000	3.3 •	0.0033	0.5	8000†
C	Grid-pulsed Amplifier or Oscillator at 1030 MHz	8000	5.0 •	4700	1.5 •	0.0033	0.5	3250‡
C	Plate-pulsed Amplifier or Oscillator	10,000	5.0 •	—	—	—	—	—
—	Switch Tube or Pulse Modulator	8000	5.0 •	—	—	—	—	—

- Average during the pulse,

8940



The 8940 is a planar triode for advanced airborne, ground, and space applications up to 2500 MHz.

The tube may be used as an amplifier, oscillator, or frequency multiplier, in the grid or plate pulsed mode, as well as a modulator or series regulator tube.

The 8940 is normally supplied without radiator and may be conduction, convection, heat-sink or liquid cooled, such as immersion cooling in an insulating medium (e.g. FC-75). Radiators for forced-air cooling, as well as heat-sink adaptors, permitting anode dissipation up to 750 watts are available.

CHARACTERISTICS

Plate Dissipation (Max.)	Dependent on Cooling Technique
Grid Dissipation (Max.)	2.0 watts
Frequency for Max. Ratings (CW)	2500 MHz
(Pulsed)	3000 MHz
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	2.25 amperes
Capacitances: Grid-Cathode	16.0 pF
Grid-Plate	3.8 pF
Plate-Cathode	0.11 pF
Amplification Factor (Mu)	65
Transconductance (Sm)	100 mmhos
Anode	Threaded stud, 1/2-20 UNF for heat transfer; Tapered flange for electrical contact.
Grid, Cathode/Heater Contacts	Special, Coaxial
Heater Contact	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	1.98 in; 50.29 mm
Maximum Diameter:	1.37 in; 34.80 mm
Weight (approximate)	2.0 oz; 56 gm
Operating Position	Any

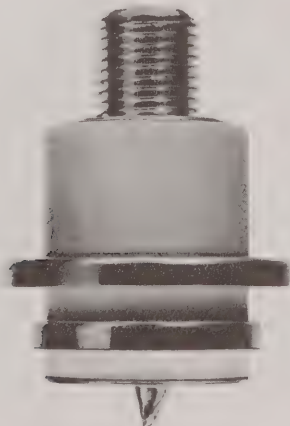
Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1200 MHz	4000	12 •	4000	3.0 •	0.01	500	6,000†
C	Plate-pulsed Amplifier or Oscillator at 2000 MHz	6500	12 •	3500	10.0 •	0.0033	6	10,000†
A,B, or C	RF Amplifier or Oscillator at 800 MHz	4000	0.6	1400	0.32	—	—	180*
—	Switch Tube or Pulse Modulator	4000	12 •	—	—	0.0033	6	—

• Useful Power Output, delivered to the load.

† Useful Pulse Power, delivered to the load.

• Average during the pulse.

8941



The 8941 is a planar triode for advanced airborne, ground, and space applications.

The tube is intended primarily as a modulator or series regulator tube, and can be used also in grid or plate pulsed RF applications.

The 8941 is normally supplied without radiator and may be conduction, convection, heat-sink or liquid cooling, such as immersion cooling in an insulating medium (e.g., FC-75). Radiators for forced-air cooling, as well as heat-sink adaptors, permitting anode dissipation up to 750 watts are available.

CHARACTERISTICS

Plate Dissipation (Max.)	Depends on Cooling Technique
Grid Dissipation (Max.)	2.0 watts
Frequency for Max. Ratings (Pulsed)	2000 MHz
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	2.25 amperes
Capacitances: Grid-Cathode	14.0 pF
Grid-Plate	2.7 pF
Plate-Cathode	0.11 pF
Amplification Factor (Mu)	200
Transconductance (Sm)	75 mmhos
Anode	Threaded stud, 1/2-20 UNF for heat transfer; Tapered flange for electrical contact.
Grid, Cathode/Heater contacts	Special, Coaxial
Heater Contact	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.23 in; 56.64 mm
Maximum Diameter:	1.36 in; 34.54 mm
Weight (approximate)	2.0 oz; 56 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)•	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
B or C	Grid-pulsed Amplifier or Oscillator at 1090 MHz	10,000	12•	5000	4.0	0.001	3.0	10,000†
B or C	Plate-pulsed Amplifier or Oscillator	15,000	12•	—	—	—	—	—
—	Switch Tube or Pulse Modulator	15,000	12•	—	—	—	—	—

• Average during the pulse

† Useful Pulse Power, delivered to the load.

8942



The 8942 is a planar triode for advanced airborne, ground, and space applications up to 2000 MHz.

The tube may be used as an amplifier, oscillator, or frequency multiplier, in the grid or plate pulsed mode, as well as a modulator or series regulator tube.

The 8942 is normally supplied without radiator and may be conduction, convection, heat-sink or liquid cooled, such as immersion cooling in an insulating medium (e.g., FC-75). Radiators for forced-air cooling as well as heat-sink adaptors permitting anode dissipation up to 750 watts are available.

CHARACTERISTICS

Plate Dissipation (Max.)	Dependent on Cooling Technique
Grid Dissipation (Max.)	2.0 watts
Frequency for Max. Ratings (Pulsed)	2000 MHz
Cooling	Technique Optional
Cathode	Oxide-coated Unipotential
Heater: Voltage	6.3 volts
Current	2.25 amperes
Capacitances: Grid-Cathode	15.0 pF
Grid-Plate	3.0 pF
Plate-Cathode	0.11 pF
Amplification Factor (Mu)	115
Transconductance (Sm)	90 mmhos
Anode	Threaded stud, 1/2-20 UNF for heat transfer; Tapered flange for electrical contact.
Grid, Cathode/Heater contacts	Special, Coaxial
Heater Contact	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.23 in; 56.64 mm
Maximum Diameter	1.36 in; 34.54 mm
Weight (approximate)	2.0 oz; 56 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)*	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator	6000	12*	—	—	—	—	—
C	Plate-pulsed Amplifier or Oscillator at 1300 MHz	7500	12*	7500	12	0.001	1.0	30,000†
—	Switch Tube or Pulse Modulator	8000	12*	—	—	—	—	—

† Useful Pulse Power, delivered to the load.

* Average during the pulse.

Y-483



The Y-483 is a high voltage planar triode especially designed for switch applications in general purpose as well as radar applications. The tube capacitances and inductances are small, enabling the tube to operate in the nanosecond region. Other noteworthy features include an extended grid-anode insulator and an arc-resistant extended interface cathode, making operations of up to 6kV dc at sea level possible. The tube exhibits the standard features of a planar triode such as high transconductance, high mu, and great mechanical strength, permitting reliable operation at elevated temperatures. A special feature of this tube is a supported grid structure, minimizing possible effects of mechanical grid resonance and improved grid dissipation capability.

The compact ceramic/metal construction and solder tabs provided on grid, cathode heater, and heater terminals make this tube especially suited for ECM and other switch applications. The tube is small in size and light-weight. The cathode is an indirectly heated disc requiring minimum heater power. These factors are of great importance in airborne applications.

CHARACTERISTICS

Plate Dissipation (Max)	Dependent on Cooling Technique
Grid Dissipation (Max)	2.0 Watts
Cooling	Oil and Heat Sink
Cathode	Oxide-coated Unipotential
Voltage	6.3 Volts
Current	1.3 Amperes
Capacitances (Grounded Grid Connection)	
Grid/Cathode	9.5 pF
Plate/Cathode	0.06 pF
Grid/Plate	4.8 pF
Amplification Factor	80
Base	Special, Solder Tabs
Plate Dissipation	Dissipation of 150 Watts can be achieved using appropriate heat sink.
Anode	Threaded stud, 5/16-24 UNF-2A for heat transfer and electrical contact.
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	1.15 in; 2.92 cm
Maximum Diameter	0.78 in; 1.98 cm
Weight (Approximate)	0.53 oz; 15 gm
Operating Position	Any

MAXIMUM RATINGS				
Peak Plate Voltage (kV)	DC Plate Voltage (kV)	Pulse Duration (μs)	Pulse Cathode Current (A)	Duty
10	6	6	7.5	0.0033

YU-176



The YU-176 is a ceramic-metal planar triode designed for airborne, ground or space applications. It can be used as an RF amplifier or oscillator at frequencies as high as 1.5 GHz or as a series regulator or modulator. The extended grid to anode ceramic allows plate voltages up to 12 kV. The tube features high transconductance and μ , an oxide cathode, and a rugged mesh grid.

The tube is normally supplied without a radiator. Cooling may be accomplished by conduction, convection, or liquid. Radiators for forced air cooling and adapters, permitting anode dissipation up to 800 watts, are available as separate items.

CHARACTERISTICS

- Plate Dissipation (Max) Dependent on Cooling
- Grid Dissipation (Max) 2.0 Watts
- Frequency for Max Ratings (CW) 1200 MHz
- (Pulsed) 2000 MHz
- Cooling Technique Optional
- Cathode Oxide-Coated Unipotential
- Voltage 6.3 Volts
- Current 3.80 Amperes
- Capacitances (Grounded Grid Connection)
- Input 28 pF
- Output 3.4 pF
- Feed-through 0.090 pF
- Amplification Factor 200
- Anode Threaded stud, 3/4-20 UNF, for heat transfer; tapered flange for electrical contact.
- Base Special Coaxial
- Maximum Envelope Temperature 250°C
- Maximum Anode Temperature 250°C
- Maximum Length 2.83 in; 71.88 mm
- Maximum Diameter 1.4 in; 35.56 mm
- Weight (Approximate) 5.2 oz; 146 gm
- Operating Position Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION					
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (Watts)	Output Power Watts	Pulse Length	Duty
C	Grid Pulsed Amplifier or Oscillator	10,000	14*	7000	5*	700	25,000	100 μ Sec	0.01
---	Switch Tube or Pulse Modulator	15,000	14*	---	---	---	---	---	---

* Average during the pulse.

YU-328



The YU-328 is a planar triode for use as a highly linear amplifier for TV translator service up to 1.5 GHz. It may be used as an amplifier or oscillator in CW mode, or grid- or plate-pulsed. In translator service, transmitting simultaneous video and aural signals in the same channel, the intermodulation level is better than -52 dB.

CHARACTERISTICS

Plate Dissipation (Max)	1000 Watts
Grid Dissipation (Max)	1.5 Watts
Frequency for Max. Ratings (CW)	1500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	5.5 Volts
Current	3.2 Amperes
Capacitances (Grounded Grid Connection)	
Grid/Cathode	19.0 pF
Plate/Cathode	0.07 pF
Grid/Plate	6.5 pF
Amplification Factor	165
Transconductance	100 mmhos
Base	Special Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	3.19 in; 81.03 mm
Maximum Diameter	2.79 in; 71.40 mm
Weight (Approximate)	26.8 oz; 760 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Gain (dB)	Output Power (watts)
A	RF Linear Amplifier #	3000	0.6	1900	0.35	21	100†

760 MHz
† Peak Sync

Y-739F



The Y-739F, a planar triode of ceramic/metal construction, is designed for ground and airborne applications. The tube is especially suited in ground Tacan applications where peak powers up to 8kW with a gain of 13 dB can be obtained. The tube employs the standard features of a planar triode, such as high transconductance, high mu, and high current capability from an arc-resistant, extended interface matrix cathode.

CHARACTERISTICS

Plate Dissipation (Max)	600 Watts
Grid Dissipation (Max)	2.0 Watts
Frequency for Max. Ratings (CW)	1200 MHz
(Pulsed)	2000 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Heater:	
Voltage	6.3 Volts
Current	2.25 Amperes
Capacitances (Grounded Grid Connection)	
Grid/Cathode	14.5 pF
Plate/Cathode	0.1 pF
Grid/Plate	2.1 pF
Amplification Factor	175
Grid, Cathode/Heater Contacts	Special Coaxial
Heater Contact	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	4.37 in; 11.1 cm
Maximum Diameter	2.6 in; 6.6 cm
Weight (Approximate)	1.7 lb; 0.77 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Duty	Pulse Length (μs)	Output Power (watts)
C	Grid-pulsed Amplifier or Oscillator at 1200 MHz	4000	12 •	4000	3.0 •	0.01	500	6,000†
C	Plate-pulsed Amplifier or Oscillator at 2000 MHz	6500	12 •	3500	10.0 •	0.0033	6	10,000†
A,B, or C	RF Amplifier or Oscillator at 800 MHz	4000	0.6	1400	0.32	—	—	180*
—	Switch Tube or Pulse Modulator	4000	12 •	—	—	0.0033	6	—

• Useful Power Output, delivered to the load.
† Useful Pulse Power, delivered to the load.
• Average during the pulse.

Y-810, Y-811, Y-812**CHARACTERISTICS**

The Y-810, Y-811, and Y-812 are specifically designed for high voltage series regular or switch tube (modulator) service. The compact, rugged design has very low internal inductance and capacitance to improve rise and fall times for very short pulse applications. The tubes can be mounted in optional operating positions and are capable of sustaining vibration and shock.

Plate Dissipation (Max) Dependent on Cooling Technique
 Grid Dissipation (Max) 1.5 Watts
 Cooling Oil and Heat Sink
 Cathode Oxide-coated Unipotential
 Voltage 6.3 Volts
 Current 2.25 Amperes
 Capacitances (Grounded Grid Connection)
 Grid/Cathode 8.0 pF
 Plate/Cathode 0.003 pF
 Grid/Plate 2.5 pF
 Amplification Factor
 Y-810 1300
 Y-811 950
 Y-812 800
 Base Special
 Plate Dissipation Dissipation of 1000 Watts can be achieved using appropriate heat sink.
 Maximum Seal & Anode Core Temperature 250°C
 Maximum Length
 Y-810 3.08 in; 78.11 mm
 Y-811 2.83 in; 71.75 mm
 Y-812 2.70 in; 68.58 mm
 Maximum Diameter 3.01 in; 76.45 mm
 Weight (Approximate) 18.34 oz; 520 gm
 Operating Position Any

MAXIMUM RATINGS					
Tube Type	Peak Plate Voltage (kV)	DC Plate Voltage (kV)†	Pulse Duration (μs)	Pulse Cathode Current (A)	Duty
Y-810	95.0	85.0	6.0	10	.0033
Y-811	70.0	65.0	6.0	10	.0033
Y-812	45.0	40.0	6.0	10	.0033

† In oil and in conjunction with EIMAC PRB 20761 corona shield.

Y-820**CHARACTERISTICS**

The Y-820 is a high voltage switch tube designed especially for short pulsed (nanosecond) applications. It can also be used in series or shunt regulators where high voltage and low current are required in addition to fast switching. Solder tabs are used in order to minimize input capacitance to provide minimum fall and rise times.

Plate Dissipation (Max) Dependent on Cooling Technique
 Grid Dissipation (Max) 2.0 Watts
 Cooling Technique Optional
 Cathode Oxide-coated Unipotential
 Voltage 6.3 Volts
 Current 2.25 Amperes
 Capacitances (Grounded Grid Connection)
 Grid/Cathode 16.0 pF
 Plate/Cathode 0.03 pF
 Grid/Plate 1.7 pF
 Amplification Factor 650
 Anode Threaded stud 5/8-18 UNSP-2A for heat transfer and electrical contact
 Grid Cathode and Heater Contacts . . . Special solder tabs
 Plate Dissipation Dissipation of 400 Watts can be achieved using EIMAC cooling adapter 164084.
 Maximum Seal & Anode Core Temperature 250°C
 Maximum Length 2.80 in; 71.12 mm
 Maximum Diameter 1.40 in; 35.56 mm
 Weight (Approximate) 4.6 oz; 130 gm
 Operating Position Any

MAXIMUM RATINGS				
Peak Plate Voltage (kV)	DC Plate Voltage (kV)†	Pulse Duration (μs)	Pulse Cathode Current (A)	Duty
30.0	25.0†	6.0	12	.0033

† In oil and in conjunction with EIMAC PRB 20761 corona shield.

YU-338



The YU-338 is a planar triode for use as a highly linear amplifier for TV translator service up to 1.5 GHz. It may be used as an amplifier or oscillator in CW mode, or grid- or plate-pulsed. In translator service, transmitting simultaneous video and aural signals in the same channel, the intermodulation level is better than -52 dB.

CHARACTERISTICS

Plate Dissipation (Max)	1500 Watts
Grid Dissipation (Max)	1.5 Watts
Frequency for Max. Ratings (CW)	1500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	5.7 Volts
Current	3.3 Amperes
Capacitances (Grounded Grid Connection)	
Input	21.0 pF
Feed-through	0.07 pF
Output	6.9 pF
Amplification Factor	90
Transconductance	120 mmhos
Base	Special Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	3.19 in; 81.03 mm
Maximum Diameter	3.18 in; 80.8 mm
Weight (Approximate)	38.8 oz; 1.0 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Gain (dB)	Output Power (watts)
A	RF Linear Amplifier#	3000	0.6	2400	0.35	16	200†

803 MHz

† Peak Sync

YU-339



The YU-339 is a planar triode for use as a highly linear amplifier for TV translator service up to 1.5 GHz. It may be used as an amplifier or oscillator in CW mode, or grid- or plate-pulsed. In translator service, transmitting simultaneous video and aural signals in the same channel, the intermodulation level is better than -52 dB.

CHARACTERISTICS

Plate Dissipation (Max)	1500 Watts
Grid Dissipation (Max)	1.5 Watts
Frequency for Max. Ratings (CW)	1500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	5.7 Volts
Current	3.3 Amperes
Capacitances (Grounded Grid Connection)	
Grid/Cathode	18.0 pF
Plate/Cathode	0.07 pF
Grid/Plate	7.3 pF
Amplification Factor	160
Base	160
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	3.19 in; 81.03 mm
Maximum Diameter	3.18 in; 80.8 mm
Weight (Approximate)	35.3 oz; 1.9 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Gain (dB)	Output Power (watts)
A	RF Linear Amplifier #	3000	0.6	2400	0.35	19	200†

803 MHz

† Peak Sync

Y-847



The Y-847 is a specifically designed planar triode for high voltage series regulator or switch tube (modulator) service. The compact, rugged design has very low internal inductance and capacitance to improve rise and fall times for very short pulse applications. The tube can be mounted in any operating position and is capable of sustaining vibration and shock.

CHARACTERISTICS

Plate Dissipation Dissipation of 2000 watts in oil
can be achieved using appropriate radiator
Grid Dissipation (Max) 2.0 Watts
Cooling Oil and Heat Sink
Cathode Tungsten Matrix
Voltage 6.3 Volts
Current 8.4 Amperes
Capacitances (Grounded Cathode Connection)
Input 23.0 pF
Output 0.003 pF
Feed-through 3.5 pF
Amplification Factor 1300
Base Special
Maximum Seal & Anode Core Temperature 250°C
Maximum Length 5.83 in; 148 mm
Maximum Diameter 5.94 in; 151 mm
Weight (Approximate) 5.26 lb; 2.39 kg*
Operating Position Any

*Weight without corona rings and radiator

MAXIMUM RATINGS			
DC Plate Voltage (kV)†	Pulse Duration (μs)	Pulse Cathode Current (A)	Duty
150.0†	20	15	0.1

† In oil and in conjunction with EIMAC 171653 corona rings.

YU-113



The YU-113 tube has been specifically designed for high-voltage regulator or switch-tube (modulator) service. The compact, rugged design has very low internal inductance and capacitance to improve rise and fall times for very short pulse applications. The tube is capable of surviving severe vibration and shock. The YU-113 incorporates a tungsten matrix (dispenser) cathode which is especially suited for long pulses and/or high duty cycle operation.

CHARACTERISTICS

Plate Dissipation Dissipation of 1000 watts in oil
can be achieved using appropriate heat sink
Grid Dissipation (Max.) 2.0 Watts
Cooling Oil and Heat Sink
Cathode Tungsten Matrix
Voltage 6.3 Volts
Current 8.4 Amperes
Capacitances (Grounded Cathode Connection)
Input 22 pF
Output 0.03 pF
Feed-through 2.5 pF
Amplification Factor 750
Base Special
Maximum Seal & Anode core Temperature 250°C
Maximum Length 2.83 in; 71.9 mm
Maximum Diameter 3.05 in; 77.5 mm
Weight (approximate) 1.25 lb; .57 kg
Operating Position Any

MAXIMUM RATINGS			
DC Plate Voltage (kV)†	Pulse Duration (μs)	Pulse Cathode Current (A)	Duty
55†	100.0	15	0.10

† In oil and in conjunction with EIMAC 171104 corona shield.

YU-132



The YU-132 tube has been specifically designed for high-voltage series regulator or switch-tube (modulator) service. The compact, rugged design has very low internal inductance and capacitance to improve rise and fall times for very short pulse applications. The tube is capable of surviving severe vibration and shock.

CHARACTERISTICS

Plate Dissipation Dissipation of 10,000 watts in oil can be achieved using appropriate radiator.
 Grid Dissipation (Max.) 2 Watts
 Cooling Oil and Heat Sink
 Cathode Tungsten Matrix
 Voltage 6.3 Volts
 Current 8.4 Amperes
 Capacitances (Grounded Cathode Connection)
 Input 22 pF
 Output 0.003 pF
 Feed-through 3.5 pF
 Amplification Factor 1300
 Base Special
 Maximum Seal & Anode core Temperature 250°C
 Maximum Length 8.80 in; 224 mm
 Maximum Diameter 5.94 in; 151 mm
 Weight (approximate) 7.26 lb; 3.3 kg*
 Operating Position Any

* Weight without radiator

MAXIMUM RATINGS			
DC Plate Voltage (kV)†	Pulse Duration (μs)	Pulse Cathode Current (A)	Duty
150	20	10	0.1

† In oil and in conjunction with EIMAC 165374 corona rings.

YU-141



The YU-141 is a ceramic-metal planar triode designed for airborne, ground or space applications. It can be used as an RF amplifier or oscillator at frequencies as high as 1.5 GHz, or as a series regulator or modulator. The extended grid to anode ceramic allows plate voltages up to 12 kV. The tube features high transconductance and μ , an oxide cathode, and a rugged mesh grid.

The tube is normally supplied without a radiator. Cooling may be accomplished by conduction, convection, or liquid. Radiators for forced air cooling and adapters, permitting anode dissipation up to 800 watts, are available as separate items.

CHARACTERISTICS

Plate Dissipation (Max.) Dependent on Cooling
 Grid Dissipation (Max.) 2.0 watts
 Frequency for Max Ratings:
 (CW) 1200 MHz
 (Pulsed) 2000 MHz
 Cooling Forced Air
 Cathode Oxide-coated Unipotential
 Voltage 6.3 volts
 Current 2.25 amperes
 Capacitances (Grounded Grid Connection)
 Input 15.5 pF
 Output 1.95 pF
 Feed-through04 pF
 Amplification Factor 155
 Base Coaxial
 Maximum Seal & Anode Core Temperature 250°C
 Maximum Length 2.325 in; 59.06 mm
 Maximum Diameter 1.090 in; 27.69 mm
 Weight (approximate) 2.5 oz; 70 gm
 Operating Position Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION					
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)	Pulse Duration	Duty
C	Grid Pulsed Amplifier or Oscillator	8,000	12*	5,000	4*	300	11,000	5μ Sec	0.001

* Average during the pulse.

EIMAC HIGH-PERFORMANCE FOCUSED TRIODES

This new series of focused triodes is designed specifically for operation in the UHF/VHF spectrum. The triodes are designed with beam-forming cathode and control grid geometry. This beam focusing feature provides high gain and low grid interception. These triodes eliminate many of the cavity and equipment design complications associated with tetrodes. Performance is equal or superior to equivalent tetrodes.

For convenience, the series of new tube types is listed at right. The page number of the catalog is referenced where additional information may be found on each type. For additional information, contact Product Manager, Varian Power Grid & X-ray Tube Products, 301 Industrial Way, San Carlos, CA 94070, Phone (415) 592-1221.

EIMAC Type Number	Rated Plate Dissipation (watts)	F(max) CW (MHz)	Page Number
3CX400A7 8874	400	500	38
3CX400U7 8961	400	1000	38
3CX600U7	600	1000	39
3CX800A7	800	350	39
3CPX800A7	800	500	36
3CX800U7	800	1000	40
3CX1500A7	1500	250	43
3CX1500C7	1500	500	43
3CPX3500U7	3500	500	37
3CX5000A7	5000	110	48
3CX5000U7	5000	1000	49
3CPX5000A7	5000	110	37
3CX10,000B7	10,000	110	51
3CX10,000U7	10,000	250	52
3CX15,000B7	15,000	110	53

3CPX800A7



The 3CPX800A7 is a compact high-mu power triode intended for use in zero-bias class-B amplifiers in pulsed radio-frequency applications. It may also be used as a pulse modulator or regulator. A single 3CPX800A7 will deliver 6 kW peak output in drive-pulsed RF service.

CHARACTERISTICS

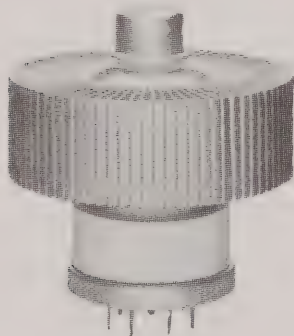
Plate Dissipation (Max)	800 watts
Grid Dissipation (Max.)	4 watts
Frequency for Max. Ratings	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	13.5 volts
Current	1.5 amperes
Capacitances (Grounded Grid Connection)	
Input	26.0 pF
Output	6.1 pF
Feed-through	0.05 pF
Amplification Factor	200
Base	Large Wafer Elevenar 11-pin
Available Contact Collets:	
Grid	Part No. 882931
Grid (w. grounding ring)	720359
Recommended Air System Socket	SK-1900
Recommended Air Chimney	SK-1906
Available Chimney Clamp	SK-1916
Recommended Anode Connector	ACC-1
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.52 in; 64.01 mm
Maximum Diameter	2.53 in; 64.26 mm
Weight (approximate)	12 oz; 340 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps) †	Plate Voltage (volts)	Plate Current (amps) ††	Drive Power (watts)	Output Power (watts)
AB ₂	Cathode Driven RF Linear Amplifier	3500	8.0	3500	2.5	320	6000†
—	Pulse Modulator or Regulator	4500	8.0	4500	5.0	25	20,000

† Average during the pulse.

†† Short pulse.

3CPX1500A7



The 3CPX1500A7 is a rugged high-mu power triode, designed with beam-forming cathode and control-grid geometry to allow the simplicity of design and circuit advantages of a triode with the gain of a tetrode. The tube is intended for pulse modulator or pulse regulator service. The external anode may be forced air cooled, or for higher voltage hold-off capability the complete tube may be liquid immersed for both insulation improvement and cooling. This tube may be used in grid or plate pulsed RF application where high peak power is required.

CHARACTERISTICS

Plate Dissipation (Max)	1500 Watts
Grid Dissipation (Max)	25 Watts
Cooling	Liquid or Air
Cathode	Oxide-coated Unipotential
Voltage	5.5 Volts
Current	11.2 Amperes
Capacitances (Grounded Cath. Connection)	
Input	38.5 pF
Output (Max)	0.2 pF
Feed-through	10.2 pF
Transconductance	55,000 μ mhos
Amplification Factor	200
Base	Special 7-pin
Recommended Air System Socket	SK-2200
Recommended Air Chimney	SK-2216
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	4.02 in; 102.00 mm
Maximum Diameter	3.38 in; 86.00 mm
Weight (Approximate)	26.02 oz; 0.735 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (kV)	Plate Current (amps)*	Plate Voltage (kV)	Plate Current (amps)*	Drive Power (Watts)	Output Power (watts)
Forced Air	Grid driven pulse regulator or modulator	10.0	50.0	10.0	40.0	700	306**
Liquid Immersed	Grid driven pulse regulator or modulator	15.0	50.0**	15.0	40.0	735	506**

** $t_p = 10 \mu$ sec, see pulse rating curve for longer pulse.

* Peak Value

3CPX3500U7



The 3CPX3500U7 high-mu triode is designed for use as a cathode-driven RF amplifier in the VHF/UHF spectrum.

The 3CPX3500U7 is designed for pulsed RF service. It may also be used as a pulse modulator or regulator.

CHARACTERISTICS

- Plate Dissipation (Max.) 3500 Watts
- Grid Dissipation (Max.) 50 Watts
- Frequency for Max. Ratings (CW) 500 MHz
- (Pulsed) 1000 MHz
- Cooling Forced Air
- Cathode Oxide-coated Unipotential
- Voltage 15.0 volts
- Current 13.0 amperes
- Capacitances (Grounded Grid Connection)
- Input 86.5 pF
- Output 23.5 pF
- Feed-through 0.25 pF
- Amplification Factor 200
- Base Special Coaxial
- Available Contact Collets:
- Grid Part No. 720636
- Heater-Cathode 720637
- Heater 720638
- Recommended Socket* SK-2500
- Recommended Air Chimney SK-356
- Maximum Seal & Anode Core Temperature 250°C
- Maximum Length 4.50 in; 114.3 mm
- Maximum Diameter 4.94 in; 125.4 mm
- Weight (approximate) 5.5 lb; 2.5 kg
- Operating Position Any

* For operation above 200 MHz, individual collets are recommended

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)†	Plate Voltage (volts)	Plate Current (amps)††	Drive Power kW	Output Power kW
AB ₂	Cathode Driven Pulsed RF Amplifier, 400 MHz	6,500	54	6400	12	5	41

† Average during the pulse.

†† Short pulse.

3CPX5000A7



The 3CPX5000A7 high-mu triode is designed for use as a cathode-driven Class AB pulsed power amplifier and as a switch-tube in cathode or grid-driven service. The tube does not require a socket as it is designed to bolt directly to the chassis by means of the grid flange. Cathode and heater connections are made by bolting directly to the amplifier circuitry. These features reduce equipment cost and complexity.

CHARACTERISTICS

- Plate Dissipation (Max.) 5000 watts
- Grid Dissipation (Max.) 35 watts
- Frequency for Max. Ratings (CW) 110 MHz
- Cooling Forced Air
- Cathode Oxide-coated Unipotential
- Voltage 15.0 volts
- Current 14.0 amperes
- Base Direct Chassis Mounting
- Amplification Factor 200
- Recommended Air Chimney SK-306
- Maximum Seal & Anode Core Temperature 250°C
- Maximum Length 8.25 in; 20.96 cm
- Maximum Diameter 4.94 in; 12.55 cm
- Weight (approximate) 9.5 lb; 4.3 kg
- Operating Position Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)†	Plate Voltage (volts)	Plate Current (amps)†	Drive Power (watts)	Output Power (watts)
AB	Cathode Driven RF Linear Amplifier, Pulsed	6500	67	6500	14.9	6500	60,000
—	Switch Tube or Pulse Modulator	12,000	67	12,000	60	—	—

† Average during the pulse.

3CX400A7/8874



The 3CX400A7/8874 is a compact high- μ power triode intended for use in zero-bias Class B amplifiers in audio or RF applications. Operation with zero bias simplifies circuitry and cathode-driven operation is attractive since a power gain as high as twenty can be obtained.

CHARACTERISTICS

Plate Dissipation (Max.) 400 Watts
 Grid Dissipation (Max.) 5 Watts
 Frequency for Max. Ratings (CW) 500 MHz
 Cooling Forced Air
 Cathode Oxide-coated Unipotential
 Voltage 6.3 volts
 Current 3.0 amperes
 Capacitances (Grounded Grid Connection):
 Input 20.5 pF
 Output 6.0 pF
 Feed-through 0.03 pF
 Amplification Factor 240
 Transconductance 29,000 μ mhos
 Base Large Wafer Elevenar 11-pin
 Available Contact Collets:
 Plate Part No. 008294
 Grid 882931
 Grid (w. grounding ring) 720359
 Recommended Air System Socket SK-1900
 Recommended Air Chimney SK-606
 Maximum Seal & Anode Core Temperature 250°C
 Maximum Length 2.14 in; 54.40 mm
 Maximum Diameter 1.64 in; 41.70 mm
 Weight (approximate) 4.3 oz; 122 gm
 Operating Position Any

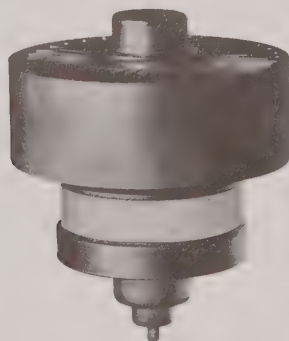
Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₂	Cathode Driven RF Linear Amplifier (30MHz)	2200	0.35	2000	0.5*	26	587†
AB ₂	Cathode Driven RF Linear Amplifier (150MHz)	2200	0.35	2000	0.4*	18	526†
AB ₂	Cathode Driven RF Linear Amplifier (432 MHz)	2200	0.35	2000	0.5*	27	505†
—	Pulse Modulator or Regulator	4500	6.0††	—	—	—	—

* Single-tone Intermittent Voice Service Value

† Useful Power Output

†† Short Pulse

3CX400U7/8961



The 3CX400U7/8961 is a high- μ power triode designed for use above 200 MHz as a CW, pulse, or linear RF amplifier, particularly in the 806 to 1000 MHz portion of the spectrum allocated to land mobile service. The tube is designed with beam-forming cathode and control-grid geometry, and has an anode rating of 400 watts.

With an amplification factor of over 200 and minimum current interception by the grid the tube has excellent power gain in cathode-driven circuitry. Over 200 watts of useful CW RF power may be obtained with better than 33% efficiency and better than 10 dB of gain in the UHF region.

CHARACTERISTICS

Plate Dissipation (Max.) 400 Watts
 Grid Dissipation (Max.) 5 Watts
 Frequency for Max. Ratings (CW) 1000 MHz
 Cooling Forced Air
 Cathode Oxide-coated Unipotential
 Voltage 6.3 volts
 Current 3.0 amperes
 Capacitances (Grounded Grid Connection):
 Input 18.4 pF
 Output 6.1 pF
 Feed-through 0.07 pF
 Amplification Factor 240
 Transconductance 29,000 μ mhos
 Base Special Coaxial
 Special Collets Available
 Maximum Seal & Anode Core Temperature 250°C
 Maximum Length 2.50 in; 63.70 mm
 Maximum Diameter 2.10 in; 52.90 mm
 Weight (approximate) 5.5 oz; 155 gm
 Operating Position Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier at 850 MHz	1500	0.4	1500	0.4	13	225†

† Useful Power Output

3CX600U7



The 3CX600U7 is a high- μ power triode designed for use above 200 MHz as a CW, pulse, or linear RF amplifier. This high- μ triode is designed with beam-forming cathode and control grid geometry. It has an anode rating of 600 watts.

The combination of an amplification factor over 200 and minimum current interception by the control grid provides good power gain in cathode-driven amplifiers. Coaxial terminals and continuous cone-shaped conductors for the grid and cathode allow the lowest possible inductance between these tube elements and the cavity.

445 watts of useful CW RF power may be obtained with better than 40% efficiency, and better than 14 dB of gain, at 775 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	600 watts
Grid Dissipation (Max.)	6 watts
Frequency for Max. Ratings (CW)	1000 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage (See UHF Derating Curve on data sheet)	6.0 volts
Current	5.4 amperes
Capacitances (Gnd. Grid Connection)	
Input	26.6 pF
Output	9.2 pF
Feed-through	11 pF
Amplification Factor	200
Base	Special Coaxial
Recommended Air System Socket	Special; collets available
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.33 in; 59.2 mm
Maximum Diameter:	2.08 in; 52.8 mm
Net Weight (approximate)	7.7 oz.; 22 kg.
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	2000	0.6	1750	0.6	15	445*

* Measured data @775 MHz

3CX800A7



The 3CX800A7 is a compact high- μ power triode intended for use in zero-bias class-B amplifiers in audio or radio-frequency applications. It may also be used as a pulse modulator or regulator. A single 3CX800A7 will deliver 750 watts PEP and 750 watts keydown CW output to 350 MHz. Linearity and power gain are excellent due to the beam-forming geometry of the special grid and cathode design.

CHARACTERISTICS

Plate Dissipation (Max.)	800 Watts
Grid Dissipation (Max.)	4 Watts
Frequency for Max. Ratings (CW)	350 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	13.5 Volts
Current	1.5 amperes
Capacitances (Grounded Grid Connection):	
Input	26.0 pF
Output	6.1 pF
Feed-through	0.05 pF
Amplification Factor	200
Base	Special Coaxial
Recommended Air System	
Socket	Large Water Elevenar 11-pin
Available Contact Collets:	
Grid	Part No. 882931
Grid (w. grounding ring)	720359
Recommended Air System Socket	SK-1900
Recommended Air Chimney	SK-1906
Available Chimney Clamp	SK-1916
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.52 in; 64.01 mm
Maximum Diameter	2.53 in; 64.26 mm
Weight (approximate)	11.5 oz; 326 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₂	Cathode Driven RF Linear Amplifier	2250	0.6	2200	0.5	23	750†
—	Pulse Modulator or Regulator	3500	8.0††	—	—	—	—

† Useful power output, 144 MHz

†† Short pulse. Average = 0.6A

3CX800U7



The 3CX800U7 is a high-mu triode designed for use above 200 MHz as a CW, pulse or linear RF amplifier. The tube is designed with beam-forming cathode and control-grid geometry, and has an anode dissipation rating of 800 watts.

Over 350 watts of useful CW RF power may be obtained with better than 33% efficiency and better than 10 dB gain at 915 MHz.

CHARACTERISTICS

- Plate Dissipation (Max.) 800 Watts
- Grid Dissipation (Max.) 4 Watts
- Frequency for Max. Ratings (CW) 1000 MHz
- Cooling Forced Air
- Cathode Oxide-coated Unipotential
- Voltage 13.5 Volts
- Current 1.5 amperes
- Capacitances (Grounded Grid Connection):
 - Input 23.3 pF
 - Output 6.2 pF
 - Feed-through 0.037 pF
- Amplification Factor 200
- Base Special Coaxial
- Available Contact Collets:
 - Grid Part No. 882931
 - Cathode 008292
 - Heater 008291
 - Heater (w. Center pin) 008290
- Maximum Seal & Anode Core Temperature 250°C
- Maximum Length 2.85 in; 72.39 mm
- Maximum Diameter 2.53 in; 64.26 mm
- Weight (approximate) 11.5 oz; 326 gm
- Operating Position Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Cathode Driven RF Amplifier (915 MHz)	1800	0.5	1800	0.5	25	350†

† Useful Power Output

3CX1000A3



The 3CX1000A3 is a medium mu, rugged power triode intended for use as a power oscillator in industrial heating applications.

CHARACTERISTICS

- Plate Dissipation (Max.) 1000 watts
- Grid Dissipation (Max.) 75 watts
- Frequency for Max. Ratings (CW) 100 MHz
- Cooling Forced Air
- Filament Thoriated Tungsten
- Voltage 7.5 volts
- Current 31.0 amperes
- Capacitances (Gnd. Cath. Connection)
 - Input 20.4 pF
 - Output 0.89 pF
 - Feed-through 9.0 pF
- Amplification Factor 24
- Base 3-pin Special
- Recommended Air System Socket SK-520
- Maximum Seal & Anode Core Temperature 250°C
- Maximum Length 7.93 in; 201.4 mm
- Maximum Diameter 2.91 in; 73.1 mm
- Weight (approximate) 2.7 lb; 1.2 kg
- Operating Position Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	6000	1.5	6000	0.75	—	3670

3CX1000A7/8283

The 3CX1000A7/8283 high-mu triode is intended for Class AB₂ linear amplifier service in either grid-driven or cathode-driven configuration. It is recommended for use as a grid-driven push-pull audio amplifier or modulator and as a cathode driven linear amplifier through the VHF-TV bands.

CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Grid Dissipation (Max.)	45 watts
Frequency for Max. Ratings (CW)	220 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	5.0 volts
Current	30.5 amperes
Capacitances (Gnd. Cath. Connection)	
Input	32.0 pF
Output	0.15 pF
Feed-through	14.0 pF
Capacitances (Gnd. Grid Connection):	
Input	32.0 pF
Output	14.0 pF
Feed-through	0.15 pF
Amplification Factor	200
Base	Special, breechblock
Recommended Air System Socket	SK-860 or SK-870
Recommended Air Chimney	SK-816
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.80 in; 121.90 mm
Maximum Diameter:	3.38 in; 85.80 mm
Weight (approximate)	2.0 lb; 0.91 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	3500	0.7	—	—	—	—
C	Grid Driven RF Amplifier Plate Modulated	2000	0.55	—	—	—	—
AB ₂	Cathode Driven RF Linear Amplifier	3500	1.0	3500	0.86	100	2060
AB ₂	Grid Driven AF Amplifier or Modulator	3500	1.0	2500	2.0*	44	3100*

*Two tubes

3CX1200A7

The 3CX1200A7 is a high-mu, forced-air cooled, rugged power triode intended for use as a zero-bias Class AB₂ RF amplifier to 110 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	1200 Watts
Grid Dissipation (Max.)	50 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 Volts
Current	21.0 amperes
Capacitances (Grounded Cathode Connection):	
Input	20.0 pF
Output	0.2 pF
Feed-through	12.0 pF
Amplification Factor	200
Base	5-Pin Special
Recommended Air System Socket	SK-410
Recommended Air Chimney	SK-436
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	6.0 in; 147.0 mm
Maximum Diameter	2.91 in; 73.1 mm
Weight (approximate)	2.5 lb; 1.1 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier	5000	0.8	3600	0.7	85	1500

3CX1200D7/YU-121



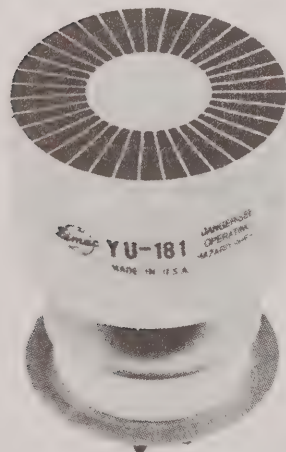
The 3CX1200D7/YU-121 is a high-mu, forced-air-cooled, rugged, ceramic/metal power triode intended for use as a grounded grid, zero-bias class AB₂ amplifier.

CHARACTERISTICS

- Plate Dissipation (Max.) 1200 watts
- Grid Dissipation (Max.) 50 watts
- Frequency for Max. Ratings (CW) 110 MHz
- Cooling Forced Air
- Filament Thoriated Tungsten
 - Voltage 6.3 volts
 - Current 25.0 amperes
- Capacitances (Grounded Cathode Connection)
 - Input 17.6 pF
 - Output 0.57 pF
- Feed-through 9.7 pF
- Amplification Factor 200
- Base 5-pin Special
- Recommended Air System Socket SK-410
- Recommended Air Chimney SK-446
- Maximum Seal & Anode Core Temperature 250°C
- Maximum Length 5.0 in; 12.7 cm
- Maximum Diameter 3.5 in; 8.9 cm
- Weight (approximate) 2.36 lb; 1.07 kg
- Operating Position Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier	5,500	0.8	4000	.562	53	1600

3CX1200Z7/YU-181

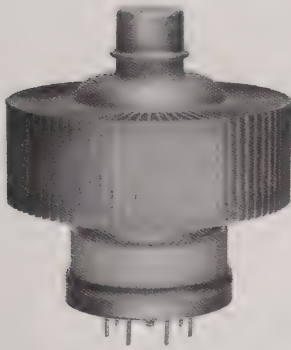


The YU-181/3CX1200Z7 is a high-mu, forced air cooled, rugged, ceramic/metal power triode for use as a grounded-grid, zero-bias class AB₂ amplifier.

CHARACTERISTICS

- Plate Dissipation (Max.) 1200 Watts
- Grid Dissipation (Max.) 50 Watts
- Frequency for Max Ratings (CW) 110 MHz
- Cooling Forced Air
- Filament Thoriated-Tungsten
 - Voltage 6.3 volts
 - Current 25.0 amperes
- Capacitances (Grounded Grid Connection)
 - Input 17.6 pF
 - Output 9.7 pF
- Feed-through 0.08 pF
- Amplification Factor 200
- Base SK-410 Socket
- Maximum Seal and Anode Core Temperature 250°C
- Maximum Length 5.550 in; 140.97 mm
- Maximum Diameter 3.5 in; 88.9 mm
- Weight (approximate) 2.4 lb; 1.09 kg
- Operating Position Vertical, base up or down

Class of Service	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
AB	RF Linear Amp	5500	0.8	4000	.562	53	1615

3CX1500A7/8877

The 3CX1500A7/8877 power triode is designed for use as a cathode-driven Class AB₂ or Class B amplifier, in audio or RF applications including the VHF band or as a cathode driven plate modulated Class C RF amplifier. As a linear amplifier, high power gain may be obtained without sacrifice of low intermodulation distortion characteristics. Low grid interception and high amplification factor combine to make drive requirements exceptionally low for a tube of this power capacity.

CHARACTERISTICS

Plate Dissipation	1500 watts
Grid Dissipation	25 watts
Frequency for Max. Ratings (CW)	250 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	5.0 volts
Current	10.5 amperes
Capacitances (Gnd. Cath. connection):	
Input	38.5 pF
Output	0.1 pF
Feed-through	10.2 pF
Capacitances (Gnd. Grid. Connection):	
Input	38.5 pF
Output	10.2 pF
Feed-through	0.1 pF
Amplification Factor	200
Transconductance	55,000 μ mhos
Base	Special 7-pin
Recommended Air System Socket:	
Grounded Grid	SK-2210
Grounded Cathode	SK-2200
Recommended Air Chimney	SK-2216
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.02 in; 102.20 mm
Maximum Diameter:	3.38 in; 85.80 mm
Weight (approximate)	1.6 lb; 0.7 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier Plate Modulated at 30 MHz	3200	0.80	2400	0.60	41	1000
B	Cathode Driven RF Linear Amplifier at 108 MHz	4000	1.0	4000	1.0	78	2600†
AB ₂	Cathode Driven RF Linear Amplifier at 220 MHz	4000	1.0	2500	1.0	57	1520†
AB ₂	Cathode Driven RF Linear Amplifier at 30 MHz	4000	1.0	3500	1.0	64	2075†

†Useful Power Output.

3CX1500C7/8938

The 3CX1500C7/8938 is a rugged coaxial-base power triode designed for use as a cathode driven Class AB₂ or Class C amplifier.

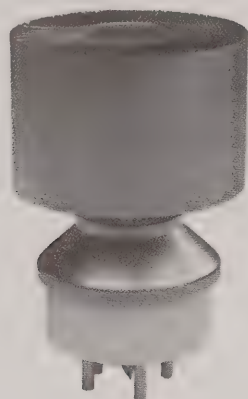
It is recommended for VHF or UHF service as a linear amplifier, power amplifier, or pulse amplifier. Linearity and power gain are both excellent due to the low ratio of grid to plate current, and the relatively high amplification factor. Low grid interception of available emission current is due to the beam forming geometry of the special grid and cathode design.

CHARACTERISTICS

Plate Dissipation (Max.)	1500 Watts
Grid Dissipation (Max.)	20 Watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	5 Volts
Current	10.5 amperes
Capacitances (Grounded Grid Connection):	
Input	35.5 pF
Output	12.4 pF
Feed-through	0.14 pF
Amplification Factor	125
Transconductance	55,000 μ mhos
Base	Coaxial
Available Contact Collets:	
Anode	Part No. 135304
Grid	135305
Cathode	135306
Heater	135307
Heater (center pin)	135310
Recommended Air-System Socket	SK-2220
Recommended Air Chimney	SK-2216
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	3.68 in; 9.34 cm
Maximum Diameter	3.38 in; 8.58 cm
Weight (approximate)	25 oz; 709 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier at 400 MHz	4000	1.0	3000	1.0	83	1570†
AB ₂	Cathode Driven RF Linear Amplifier up to 30 MHz	4000	1.0	3500	0.97	50	2030†

†Useful Power Output

3CX1500D3

The EIMAC 3CX1500D3 is a medium-mu, forced-air cooled, rugged ceramic/metal power triode intended for use as a power oscillator in industrial heating applications.

CHARACTERISTICS

Plate Dissipation (Max.)	1500 Watts
Grid Dissipation (Max.)	75 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 Volts
Current	25.0 amperes
Capacitances (Grounded Cathode Connection):	
Input	10.0 pF
Output	0.9 pF
Feed-through	10.0 pF
Amplification Factor	24
Recommended Air System Socket	SK-410
Recommended Air Chimney	SK-446
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	5.625 in; 14.29 cm
Maximum Diameter	3.42 in; 8.69 cm
Weight (approximate)	3.2 lb; 7.1 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	7000	0.8	6000	0.65	85	2800

3CX2500A3/8161, 3CX2500F3/8251, 3CX2500H3

3CX2500A3/8161

The 3CX2500A3/8161 high power triode is widely employed in AM, FM, and TV service. Its coaxial filament and grid terminals insure low-inductance connection to these electrodes and allow operation at maximum ratings through 110 MHz. The use of an external forced-air-cooled anode results in a compact structure with high power-handling capability.

The 3CX2500F3/8251 is identical except for the addition of flexible filament and grid leads on the base which can simplify low frequency installations.

The 3CX2500H3 is designed primarily for use in industrial RF heating services.



3CX2500F3/8251



3CX2500H3

CHARACTERISTICS

Plate Dissipation (Max.)	4000 watts
Grid Dissipation (Max.)	150
Frequency for Max. Ratings (CW)	
3CX2500A3/8161	110 MHz
3CX2500F3/8251 & 3CX2500H3	75 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current (all types)	51.5 amperes
Capacitances (Gnd. Cath. Connection)	
Input	35.0 pF
Output	0.9 pF
Feed-through	20.0 pF
Amplification Factor	20
Transconductance	20,000 μ mhos
Base (3CX2500A3/8161)	Coaxial
3CX2500F3/8251, 3CX2500H3	Flexible Leads
Maximum Seal & Anode	
Core Temperature	250°C
Maximum Length:	
3CX2500A3/8161	9.00 in; 228.60 mm
3CX2500F3/8251, 3CX2500H3	18.44 in; 468.40 mm
Maximum Diameter: (all types)	4.16 in; 105.70 mm
Weight (approximate): 3CX2500A3/8161	6.2 lb; 2.8 kg
3CX2500F3/8251, 3CX2500H3	7.5 lb. 3.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	6000	2.5	6000	2.1	136	10,000
C	Grid Driven RF Amplifier	6000	2.5	6000	2.1	136	10,000
C	Grid Driven RF Amplifier Plate Modulated	5500	2.0	5000	1.3	115	5,300
AB	Grid Driven AF Amplifier or Modulator	6000	2.5	6000	3.0*	113	13,000*

*Two tubes

3CX2500D3



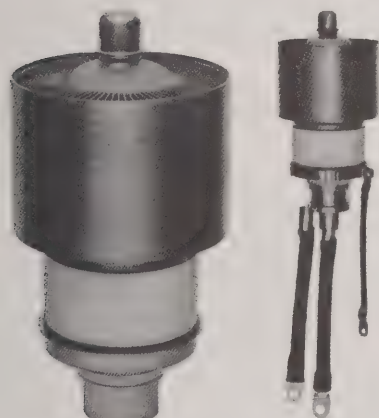
The EIMAC 3CX2500D3 is a medium-mu, forced-air cooled, rugged ceramic/metal power triode intended for use as a power oscillator in industrial heating applications.

CHARACTERISTICS

Plate Dissipation (Max.)	2500 Watts
Grid Dissipation (Max.)	75 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 Volts
Current	31.0 amperes
Capacitances (Grounded Cathode Connection):	
Input	20.0 pF
Output	0.89 pF
Feed-through	9.03 pF
Amplification Factor	24
Base	3-Pin Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	7.6 in; 19.3 cm
Maximum Diameter	4.125 in; 10.48 cm
Weight (approximate)	4.0 lb; 8.8 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	7000	1.5	6000	1.21	165	5270

3CX3000A1/8238, 3CX3000F1/8239



3CX3000A1/8238

3CX3000F1/8239

The 3CX3000A1/8238 low-mu power triode is forced-air cooled and is intended for use as an audio amplifier or modulator. Available high plate current under Class AB₁ operating conditions permits high power gain with a minimum of distortion. The tube is coaxial in construction.

The 3CX3000F1/8239 is identical except for the addition of flexible filament and grid leads on the base which can simplify some installations.

CHARACTERISTICS

Plate Dissipation (Max.)	4000 Watts
Grid Dissipation (Max.)	50 Watts
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 Volts
Current	51.5 amperes
Amplification Factor	5
Transconductance	11,000 μ mhos
Base (3CX3000A1/8238)	Coaxial
(3CX3000F1/8239)	Flexible Leads
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	
(3CX3000A1/8238)	9.00 in; 228.60 mm
(3CX3000F1/8239)	18.44 in; 464.40 mm
Maximum Diameter (both types)	4.16 in; 105.70 mm
Weight (approximate):	
(3CX3000A1/8238)	6.2 lb; 2.8 kg
(3CX3000F1/8239)	7.5 lb; 3.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	Grid Driven AF Amplifier or Modulator	6000	2.5	5500	2.2*	0	8250*

*Two tubes.

3CX3000A7, 3CX3000F7/8162

3CX3000A7



3CX3000F7/8162

The 3CX3000A7 high-mu forced-air cooled power triode provides relatively high power output as an amplifier, oscillator, or modulator at low plate voltages. The tube has a low inductance cylindrical filament-stem structure which readily becomes part of a linear filament tank circuit for VHF operation.

Operation with zero grid bias in many applications offers circuit simplicity by eliminating the bias supply. Grounded-grid operation is attractive since a power gain of over twenty times can be obtained.

The 3CX3000F7/8162 tube is identical except for the addition of flexible leads on the base for grid and filament connections which can simplify socketing in low frequency applications.

CHARACTERISTICS

Plate Dissipation (Max.)	4000 watts
Grid Dissipation (Max.)	225 watts
Frequency for Max. Ratings (CW)	
3CX3000A7	110 MHz
3CX3000F7/8162	75 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current:	
(3CX3000A7)	51.5 amperes
(3CX3000F7/8162)	50.5 amperes
Capacitances (Gnd. Cath. connection):	
Input	38.0 pF
Output	0.6 pF
Feed-through	24.0 pF
Capacitances (Gnd. Grid. Connection):	
Input	38.0 pF
Output	24.0 pF
Feed-through	0.6 pF
Amplification Factor	160
Base (3CX3000A7)	Special, coaxial
(3CX3000F7/8162)	Flexible leads
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	
(3CX3000A7)	9.00 in; 228.60 mm
(3CX3000F7/8162)	18.44 in; 468.40 mm
Maximum Diameter: (both types)	4.15 in; 105.50 mm
Weight (approximate):	
(3CX3000A7)	6.2 lb; 2.8 kg
(3CX3000F7/8162)	7.5 lb; 3.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	5000	2.5	4800	1.5	435	5500†
AB ₂	Cathode Driven RF Linear Amplifier	5000	2.5	4800	2.0	410	7260
AB ₂	Grid Driven RF Linear Amplifier	5000	2.5	4000	0.74	11.5	1130
	AM Service						
AB ₂	Grid Driven AF Amplifier or Modulator	5000	2.5	4000	3.6*	115	10,500*
D	Switching Modulator	15,000	2.5	13,700	0.53	—	—

*Two tubes

†Useful Power Output

3CX4000F3/YU-199

The 3CX4000F3/YU-199 is a medium-mu forced air cooled, ceramic/metal external anode power triode with a maximum plate dissipation rating of 4000 watts. It is intended for use as a power oscillator in industrial heating applications.

CHARACTERISTICS

Plate Dissipation (Max.)	4000 Watts
Grid Dissipation (Max.)	300 Watts
Frequency for Max Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated-Tungsten
Voltage	7.5 volts
Current	51.5 amperes
Capacitances (Grounded Cathode Connection)	
Input	35.0 pF
Output	0.9 pF
Feed-through	20.0 pF
Amplification Factor	20
Base	Flexible Leads
Maximum Envelope Temperature	250°C
Maximum Anode Temperature	150° C
Maximum Length	18.437 in; 468.40 mm
Maximum Diameter	4.156 in; 105.70 mm
Weight (approximate)	7.5 lb; 3.4 kg
Operating Position	Vertical, base up or down

Class of Service	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
C	RF Industrial Oscillator	6000	2.5	6000	2.1	136	10,000

3CX4500F3/YU-108



The 3CX4500F3/YU-108 is a medium-mu, ceramic/metal, forced-air-cooled, external anode power triode with a maximum plate dissipation rating of 6000 watts. High power output as an amplifier, oscillator, or modulator may be obtained at moderate voltages.

Reserve emission is available from the 546 watt filament, and the grid structure is rated at 300 watts, making this tube an excellent choice for severe applications.

The 3CX4500F3/YU-108 has flexible leads for the filament connections, and the grid terminations on a rugged flange, which may be used for mounting the tube in industrial applications.

CHARACTERISTICS

Plate Dissipation (Max.)	6000 Watts
Grid Dissipation (Max.)	300 Watts
Frequency for Max. Ratings (CW)	75 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.0 Volts
Current	78.0 amperes
Capacitances (Grounded Cathode Connection):	
Input	95.0 pF
Output	0.9 pF
Feed-through	20.0 pF
Amplification Factor	22
Transconductance	20,000 μ mhos
Base	Flexible Leads
Maximum Seal & Anode Core Temperature	250°C
Maximum Length*	9.0 in; 22.86 cm
Maximum Diameter	6.12 in; 15.55 mm
Weight (approximate)	9.5 lb; 43 kg
Operating Position	Vertical, base up

*Excluding leads

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	9000	3.0	8000	2.5	710	14,000

3CX5000A3



The 3CX5000A3 is a medium-mu power triode designed primarily for use as a power oscillator in industrial heating applications. It is also recommended for use as a grounded-grid FM amplifier, as a conventional plate-modulated amplifier, or as a linear amplifier.

Plentiful reserve emission is available from the 560-watt filament. The grid structure is rated at 100 watts making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 watts
Grid Dissipation (Max.)	100 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	75.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	51.0 pF
Output	1.5 pF
Feed-through	25.0 pF
Amplification Factor	18
Base	Special, coaxial
Recommended Air System Socket	SK-1300 or SK-1320
Recommended Air Chimney	SK-1316
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	8.75 in; 222.20 mm
Maximum Diameter	6.40 in; 162.70 mm
Weight (approximate)	9.5 lb; 4.3 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	7500	3.0	—	—	—	—
C	Grid Driven RF Amplifier Plate Modulated	5000	2.5	—	—	—	—
C	RF Industrial Oscillator	10,000	3.0	9000	2.5	208	18,600
AB	Grid Driven Amplifier or Modulator	7500	4.0	—	—	—	—

3CX5000A7

The 3CX5000A7 high-mu triode is designed for use as a cathode-driven Class AB power amplifier. The tube does not require a socket as it is designed to bolt directly to the chassis by means of the grid flange. Cathode and heater connections are made by bolting directly to the amplifier circuitry. These features reduce equipment cost and complexity.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 watts
Grid Dissipation (Max.)	35 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	10.0 volts
Current	17.5 amperes
Capacitances (Gnd. Grid Connection)	
Input	56.5 pF
Output	34.0 pF
Feed-through	0.42 pF
Base	Direct Chassis Mounting
Recommended Air Chimney	SK-306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	8.25 in; 20.96 cm
Maximum Diameter	4.94 in; 12.55 cm
Weight (approximate)	9.5 lb; 4.3 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	Cathode Driven RF Linear Amplifier	6500	1.5	6500	1.44	155	5000

3CX5000H3

The 3CX5000H3 is a medium-mu power triode intended for use in industrial radio-frequency heating services, or for conventional RF or audio amplifier or modulator applications.

Full input may be run up to 90 MHz. The 150 watt grid structure makes this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 Watts
Grid Dissipation (Max.)	150 Watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 Volts
Current	74.5 amperes
Capacitances (Grounded Cathode Connection):	
Input	51.0 pF
Output	1.5 pF
Feed-through	25.0 pF
Amplification Factor	18
Base	Flexible Filament Leads
Recommended Air Chimney	SK-1316
Maximum Seal & Anode Core Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	17.50 in; 444.50 mm
Maximum Diameter	6.45 in; 163.80 mm
Weight (approximate)	10.0 lb; 4.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	7500	3.0	—	—	—	—
C	Grid Driven RF Amplifier Plate Modulated	5000	2.5	—	—	—	—
C	RF Industrial Oscillator	10,000	3.0	9000	2.5	208	18,600
AB	Grid Driven AF Amplifier or Modulator	7500	4.0	—	—	—	—

3CX5000U7



The 3CX5000U7 high-mu triode is designed for use as a cathode-driven RF amplifier in the VHF-UHF spectrum.

The 3CX5000U7 makes use of a beam-forming cathode and control grid geometry to produce high gain, low grid interception, and zero-bias operation capability.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 Watts
Grid Dissipation (Max.)	25 Watts
Frequency for Max. Ratings (CW)	500 MHz
(Pulsed)	1000 MHz
Cooling	Forced Air
Cathode	Oxide-Coated Unipotential
Voltage	10.0 Volts
Current	17.5 amperes
Capacitances (Grounded Grid Connection):	
Input	60.0 pF
Output	16.0 pF
Feed-through	0.18 pF
Amplification Factor	200
Base	Special Coaxial
Available Contact Collets:	
Grid	Part No. 720636
Heater-Cathode	720637
Heater	720638
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	4.50 in; 114.3 mm
Maximum Diameter	4.94 in; 125.4 mm
Weight (approximate)	5.5 lb; 2.5 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)†	Drive Power (watts)	Output Power (watts)†
AB	Cathode Driven Low Band TV Linear RF Amplifier*	6,500	1.5	5,000	1.4	300	4,500
AB	Cathode Drive High Band TV Linear RF Amplifier*	6,500	1.5	5,500	1.5	310	4,800

*Peak of sync conditions

†Peak value

3CX6000A7/YU-148



The CX6000A7/YU-148 high-mu, forced-air-cooled power triode provides relatively high power output as an amplifier, oscillator or modulator at low plate voltages. The tube has a low-inductance cylindrical filament stem structure which readily becomes part of a linear filament tank circuit for VHF operation. The grid provides good shielding between the input and output circuits for grounded grid applications and conveniently terminates in a ring between the plate and filament terminals.

CHARACTERISTICS

Plate Dissipation (Max.)	6000 watts
Grid Dissipation (Max.)	225 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.0 volts
Current	78.0 amperes
Capacitances (Grounded Cathode Connection)	
Input	42.0 pF
Output	0.28 pF
Feed-through	24.5 pF
Amplification Factor	200
Base	Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.0 in; 22.86 cm
Maximum Diameter	6.125 in; 15.56 cm
Weight (approximate)	9.1 lb; 4.1 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	7000	3.5	5700	2.5	600	10,000

3CX10,000A1/8158, 3CX10,000A3/8159



The 3CX10,000A3/8159 is a medium- μ , power triode intended for use as a power oscillator in industrial heating applications or as an RF power amplifier in Class C or Class AB₂ linear service.

The 3CX10,000A1/8158 is a low- μ power triode intended for use as an audio amplifier and as a voltage regulator.

CHARACTERISTICS

Plate Dissipation (Max.)	10,000 watts
Grid Dissipation (Max.)	250 watts
Frequency for Max. Ratings (CW)	160 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	53.0 pF
Output	1.4 pF
Feed-through	34.0 pF
Amplification Factor (3CX10,000A1)	5
Amplification Factor (3CX10,000A3)	20
Base	Coaxial
Recommended Air System Socket	SK-1300
Recommended Air Chimney	SK-1306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	8.75 in; 222.20 mm
Maximum Diameter:	7.05 in; 179.10 mm
Weight (approximate)	12.0 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	7000	4.0	7000	4.0	4100	24,500
C	Grid Driven RF Amplifier Plate Modulated	5500	3.0	5000	3.0	515	12,400
C	RF Industrial Oscillator or Amplifier	7000	4.0	7000	4.0	600	22,400
AB ₂	Cathode Driven RF Linear Amplifier	7000	5.0	7000	4.0	2050	20,000

3CX10,000A7/8160



The 3CX10,000A7/8160 is a high- μ power triode is intended for use as a zero-bias Class B amplifier in audio or RF applications, or as a Class C amplifier, CW or modulated.

Operation in Class B with zero grid bias offers circuit simplicity by eliminating the bias supply, and in addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained with the tube.

CHARACTERISTICS

Plate Dissipation (Max.)	10,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	160 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	59.0 pF
Output	0.2 pF
Feed-through	36.0 pF
Capacitances (Gnd. Grid Connection):	
Input	59.0 pF
Output	36.0 pF
Feed-through	0.2 pF
Amplification Factor	200
Base	Coaxial
Recommended Air System Socket	SK-1300 or SK-1320
Recommended Air Chimney	SK-1306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	8.75 in; 222.20 mm
Maximum Diameter:	7.05 in; 179.10 mm
Weight (approximate)	12.0 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	8000	4.0	7600	3.7	1510	22,500
C	Grid Driven RF Amplifier Plate Modulated	6500	3.0	5000	3.0	380	11,900
AB ₂	Cathode Driven RF Linear Amplifier	8000	5.0	7000	5.0	1540	24,200
AB ₂	Cathode Driven RF Linear Amplifier AM Service	8000	5.0	7000	2.4	330	5600
AB ₂	Grid Driven AF Amplifier or Modulator	8000	5.0	7000	10.0*	560	47,700*

*Two tubes



The 3CX10,000B7 high-mu triode is designed for use as a cathode-driven Class AB power amplifier. It has exceptionally high gain and low heater power. The tube does not require a socket as it is designed to bolt directly to the chassis by means of the grid flange. Cathode and heater connections are made by bolting directly to the amplifier circuitry. These features reduce equipment cost and complexity.

CHARACTERISTICS**3CX10,000B7**

Plate Dissipation (Max.)	10,000 watts
Grid Dissipation (Max.)	35 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	15.0 volts
Current	14.0 amperes
Capacitances (Gnd. Grid Connection)	
Input	82.4 pF
Output	37.7 pF
Feed-through	0.60 pF
Amplification Factor	200
Base	Direct Chassis Mounting
Recommended Air Chimney	SK-1306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	8.26 in; 210 mm
Maximum Diameter	7.05 in; 179 mm
Weight (approximate)	10.8 lb; 4.9 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	Cathode Driven RF Linear Amplifier	6500	3.0	6000	2.6	275	10,000



The 3CX10,000H3 is a medium-mu power triode designed primarily for use in industrial RF heating service. Input of 40 kW is permissible up to 90 MHz.

CHARACTERISTICS**3CX10,000H3**

Plate Dissipation (Max.)	10,000 watts
Grid Dissipation (Max.)	250 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	53.0 pF
Output	1.4 pF
Feed-through	34.0 pF
Amplification Factor	20
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	17.75 in; 450.80 mm
Maximum Diameter	7.05 in; 179.10 mm
Weight (approximate)	13.0 lb; 5.9 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	10,000	4.0	9000	4.0	570	29,000



The 3CX5000D3 is a medium-mu air power triode designed primarily for use in industrial RF heating service.

This tube is interchangeable with the ITL12-1 in most applications.

CHARACTERISTICS**3CX10,000D3**

Plate Dissipation (Max.)	10,000 Watts
Grid Dissipation (Max.)	350 Watts
Frequency for Max. Ratings (CW)	120 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	5.8 Volts
Current	145 amperes
Capacitances (Grounded Cathode Connection):	
Input	47.0 pF
Output	1.0 pF
Feed-through	21.0 pF
Amplification Factor	22
Base	Flexible Filament Leads
Maximum Seal & Anode Core Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	9.7 in; 24.5 mm
Maximum Diameter	6.3 in; 160 mm
Weight (approximate)	10.0 lb; 4.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (amps)*	Plate Voltage (Volts)	Plate Current (amps)	Drive Power (Watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	12,000	5	8000	4.5	550	26,000

3CX10,000U7



The 3CX10,000U7 high-mu triode is designed for use as a cathode-driven RF amplifier in the VHF spectrum. It is a very linear device making it ideally suited for TV service in addition to CW and pulsed RF amplifier service.

The 3CX10,000U7 makes use of a beam-forming cathode and control grid geometry to produce high gain, low grid interception, and zero-bias operation capability.

The CV2240B and CV2250B 10 kw peak sync VHF-TV Broadcast Cavities are available for use with the 3CX10,000U7.

CHARACTERISTICS

Plate Dissipation (Max.)	10,000 watts
Grid Dissipation (Max.)	50 watts
Frequency for Max. Ratings (CW)	250 MHz
Pulsed	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	15.0 volts
Current	13.5 amperes
Capacitances (Gnd. Grid Connection)	
Input	86.5 pF
Output	23.2 pF
Feed-through	0.25 pF
Amplification Factor	200
Base	Special Coaxial
Collets Available:	
Heater	720638
Heater/Cathode	720637
Grid	720636
Anode Collet Assembly	720635
Socket	SK2500
Recommended Air Chimney	SK2506
Maximum Seal & Temperature	250°C
Maximum Length	7.3 in; 185 mm
Maximum Diameter	8.3 in; 211 mm
Weight (approximate)	20 lb; 9.1 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)†	Drive Power (watts)†	Output Power (watts)†
AB	Cathode Driven Low Band TV Linear RF Amplifier*	6500	4	5000	3.72	400	10,000
AB	Cathode Driven High Band TV Linear RF Amplifier*	6500	4	5500	3.6	410	10,000
C	Cathode Driven Pulse RF Amplifier, Short Pulse	13,000	54	7200	—	1580	40,000

*Peak of synch conditions

†Peak value

3CX15,000A3



The 3CX15,000A3 is a medium-mu power triode designed for use as a power oscillator in industrial radio frequency heating applications. It is also recommended for use as a conventional plate-modulated amplifier, or as a linear amplifier. The one kilowatt filament and rugged 500 watt grid structure make this tube especially suitable for heavy duty service.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	100 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	55.0 pF
Output	1.4 pF
Feed-through	34.0 pF
Amplification Factor	20
Base	Coaxial
Recommended Air System Socket	SK-1300
Recommended Air Chimney	SK-1306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	8.75 in; 222.30 mm
Maximum Diameter:	7.05 in; 179.10 mm
Weight (approximate)	12.0 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	8000	6.0	8000	5.9	740	34,000
C	Grid Driven RF Amplifier	6500	5.0	5000	3.9	490	18,000
AB	Plate Modulated Grid Driven RF Linear Amplifier	8000	6.0	7000	4.8	215	23,000

3CX15,000A7



The 3CX15,000A7 is a high- μ power triode intended for use as a zero-bias Class B RF amplifier or Class C power amplifier or oscillator. It is also recommended for use as a grounded grid FM amplifier. Class B operation with zero bias offers circuit simplicity. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	61.0 pF
Output	0.2 pF
Feed-through	36.0 pF
Capacitances (Gnd. Grid Connection):	
Input	61.0 pF
Output	36.0 pF
Feed-through	0.2 pF
Amplification Factor	200
Base	Coaxial
Recommended Air System Socket	SK-1300 or SK-1320
Recommended Air Chimney	SK-1306
Maximum Seal Temperature	250°C
Maximum Length:	8.75 in; 222.30 mm
Maximum Diameter:	7.05 in; 179.10 mm
Weight (approximate)	12.0 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	8000	5.0	7000	4.0	430	21,300
AB	Cathode Driven RF Linear Amplifier	8000	6.0	7000	5.9	1750	29,600

3CX15,000B7



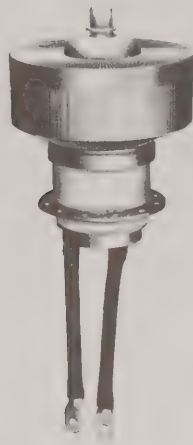
The 3CX15,000B7 high- μ triode is designed for use as a cathode-driven Class AB power amplifier. It has exceptionally high gain and low heater power. The tube does not require a socket as it is designed to bolt directly to the chassis by means of the grid flange. Cathode and heater connections are made by bolting directly to the amplifier circuitry. These features reduce equipment cost and complexity.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 watts
Grid Dissipation (Max.)	35 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	15.0 volts
Current	14.0 amperes
Capacitances (Gnd. Grid Connection)	
Input	97 pF
Output	42 pF
Feed-through	0.75 pF
Amplification Factor	200
Base	Direct Chassis Mounting
Recommended Air Chimney	SK-316
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	8.6 in; 218 mm
Maximum Diameter	7.5 in; 90 mm
Weight (approximate)	13 lb; 5.9 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	Cathode Driven RF Linear Amplifier	6500	3.75	6200	3.74	450	14,100

3CX15,000H3



The 3CX15,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	55.0 pF
Output	1.4 pF
Feed-through	34.0 pF
Amplification Factor	20
Base	Flexible filament leads
Recommended Air Chimney	SK-1306
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	17.75 in; 450.80 mm
Maximum Diameter:	7.05 in; 179.10 mm
Weight (approximate)	13.0 lb; 5.9 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	12,000	6.0	10,000	5.0	650	41,200

3CX20,000A3



The 3CX20,000A3 is a medium-mu power triode for industrial oscillator or general communications service. It is recommended for Class C amplifier service, or Class B radio frequency and audio frequency amplifier use.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Grid Dissipation (Max.)	750 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	70.0 pF
Output	2.3 pF
Feed-through	43.0 pF
Amplification Factor	20
Base	Coaxial
Recommended Air System Socket	SK-1300
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	10.00 in; 254.0 mm
Maximum Diameter:	8.00 in; 203.0 mm
Weight (approximate)	19.5 lb; 8.8 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	12,000	8.0	10,000	7.9	960	64,000
C	Grid Driven RF Amplifier Plate Modulated	6500	5.5	6500	5.0	1500	27,500
AB	Grid Driven RF Linear Amplifier	8000	8.0	7500	7.4	400	40,000
AB	Grid Driven AF Amplifier or Modulator	8000	8.0	7500	14.8*	800	80,000*

*Two tubes

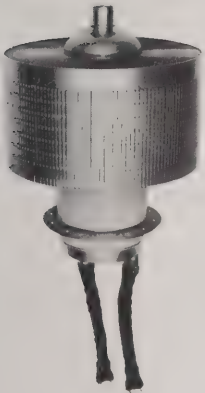
3CX20,000A7

The 3CX20,000A7 is a high- μ power triode intended for use as a zero-bias Class B RF amplifier or Class C power amplifier or oscillator. Class B operation with zero grid bias offers circuit simplicity. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	61.0 pF
Output	0.2 pF
Feed-through	36.0 pF
Capacitances (Gnd. Grid Connection):	
Input	61.0 pF
Output	36.0 pF
Feed-through	0.2 pF
Amplification Factor	200
Base	Coaxial
Recommended Air System Socket	SK-1300 or SK-1320
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	8.75 in; 222.20 mm
Maximum Diameter:	8.31 in; 211.10 mm
Weight (approximate)	13.5 lb; 6.15 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier at 110 MHz	10,000	5.0	7000	4.0	430	21,300
C	Cathode Driven RF Amplifier at 110 MHz	10,000	5.0	7800	4.2	2300	27,500
B	Cathode Driven RF Amplifier TV Service at 216 MHz†	10,000	6.0	7200	5.8	1700	27,500
AB	Cathode Driven RF Linear Amplifier at 110 MHz	10,000	6.0	7000	5.0	1540	24,200

3CX20,000H3

The 3CX20,000H3 is a medium- μ power triode designed for use as an industrial oscillator in the LF to lower VHF range (30 kHz to 90 MHz). This triode may also be used for AM broadcast service as a modulator, modulated RF stage, or as a linear amplifier.

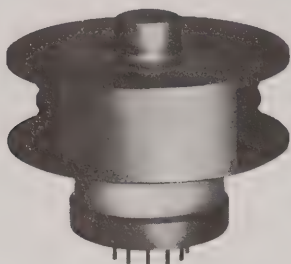
CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Grid Dissipation (Max.)	750 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	70.0 pF
Output	2.3 pF
Feed-through	43.0 pF
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	19.00 in; 482.60 mm
Maximum Diameter:	8.00 in; 203.20 mm
Weight (approximate)	20.0 lb; 9.1 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	12,000	8.0	10,000	7.9	960	64,000
C	Grid Driven RF Amplifier Plate Modulated	6500	5.5	6500	5.0	1500	27,500
AB	Grid Driven AF Amplifier or Modulator	8000	8.0	7500	14.8*	800	80,000*

*Two tubes

8875



The 8875 is a compact high- μ power triode intended for use in zero-bias Class B amplifiers in audio or RF applications. The 8875 has a transverse cooler for forced-air cooling and is rated for 300 watts.

Operation with zero grid bias simplifies circuitry by eliminating the normal bias supply. In addition, grounded-grid operation is attractive since a power gain as high as twenty can be obtained.

CHARACTERISTICS

Plate Dissipation (Max.)	300 Watts
Grid Dissipation (Max.)	5 Watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.3 Volts
Current	3.0 amperes
Capacitances (Grounded Grid Connection):	
Input	20.5 pF
Output	6.0 pF
Feed-through	0.03 pF
Amplification Factor	240
Transconductance $\uparrow\uparrow$	29,000 μ mhos
Base	Large Wafer Elevenar 11-pin with Ring
Available Contact Collets:	
Grid	Part No. 882931
Grid (w. grounding ring)	720359
Recommended Socket	SK-1900
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.18 in; 55.50 mm
Maximum Diameter	2.52 in; 64.00 mm
Weight (approximate)	4.5 lb; 127 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₂	Cathode Driven RF Linear Amplifier at 30 MHz	2200	0.35	2000	0.50*	26	587†
AB ₂	Cathode Driven RF Linear Amplifier at 150 MHz	2200	0.35	2000	0.31**	17.5	526†
AB ₂	Cathode Driven RF Linear Amplifier at 432 MHz	2200	0.35	2000	0.40* 0.245**	27	505†
C	Grid Driven RF Power Amplifier at 110 MHz	2200	0.35	2000	0.50*	9.0	305†
—	Pulse Modulator or Regulator	4500	6.0 (Short Pulse)	—	0.25	—	—

*Single-tone Intermittent Voice Service value

**Two-tone plate current

†Useful power output

††At $I_b = 250$ mA

YU-182



The YU-182 is a medium mu, forced-air cooled, rugged ceramic/metal power triode intended for use as a power oscillator in industrial heating applications.

CHARACTERISTICS

- Plate Dissipation (Max.) 1500 Watts
- Grid Dissipation (Max.) 75 Watts
- Frequency for Max Ratings (CW) 110 MHz
- Cooling Forced Air
- Filament Thoriated-Tungsten
 - Voltage 6.3 volts
 - Current 22.0 amperes
- Capacitances (Grounded Cathode Connection)
 - Input 10.0 pF
 - Output 0.8 pF
 - Feed-through 10.0 pF
- Amplification Factor 24
- Base SK-410 Socket
- Maximum Seal and Anode Core Temperature 250°C
- Maximum Length 5.750 in; 146.0 mm
- Maximum Diameter 3.925 in; 99.69 mm
- Weight (approximate) 2.75 lb; 1.25 kg
- Operating Position Vertical

Class of Service	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
C	RF Industrial Oscillator & Amplifier	7000	0.8	6000	.65	85	3150

8873



The 8873 is a compact high-mu power triode intended for use in zero-bias Class-B or AB amplifiers in audio or radio-frequency applications, but may also be used in Class-C service or as a pulse modulator or regulator.

The 8873 is designed for conduction cooling and is nominally rated for 200 watts of anode dissipation. A beryllium-oxide thermal link is available to insulate the anode from the heat sink while allowing for heat conduction from the anode to the sink.

Operation with zero bias simplifies associated circuitry by eliminating the bias supply. In addition, grounded-grid operation is attractive since a power gain as high as twenty can be obtained.

CHARACTERISTICS

Plate Dissipation (Max.)	200 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Conduction
Filament	Oxide-coated Unipotential
Voltage	6.3 volts
Current	3.0 amperes
Capacitances (Grounded Grid Connection)	
Input	20.5 pF
Output	6.0 pF
Feed-through	0.03 pF
Transconductance	29,000 μ mhos
Base	Large Wafer Elevenar 11-Pin with ring (JEDEC No. E11-81)
Recommended Socket	SK-1900
Recommended BeO Thermal Link	Eimac SK-1920
Recommended Anode Connector	ACC-1
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.14 in; 54.41 mm
Maximum Diameter	1.64 in; 41.66 mm
Weight (approximate)	4.0 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₂	Cathode Driven RF Linear Amplifier at 30 MHz	2200	0.35	2000	0.50* 0.31**	26	587†
AB ₂	Cathode Driven RF Linear Amplifier at 150 MHz	2200	0.35	2000	0.40* 0.245**	17.5	526†
AB ₂	Cathode Driven RF Linear Amplifier at 432 MHz	2200	0.35	2000	0.50* 0.30**	27	505†
C	Grid Driven RF Amplifier at 110 MHz	2200	0.35	2000	0.25	9.0	305†
—	Pulse Modulator or Regulator	4500	6.0 (Short pulse)	—	—	—	—

*Single-tone Intermittent Voice Service value

**Two-tone plate current

† Useful power output

††At $I_b = 250$ mA

3CW2000D3



The 3CW2000D3 is a medium- μ , water-cooled power triode intended for use in amplifier, oscillator or modulator service. Maximum anode dissipation of the tube is 2,000 watts. This tube is a version of the air cooled 3CX1500D3 and is recommended for industrial applications where reserve anode dissipation is required.

CHARACTERISTICS

Plate Dissipation (Max.)	2000 watts
Grid Dissipation (Max.)	75 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	25 amperes
Capacitances (Grounded Cathode Connection)	
Input	10 pF
Output	0.09 pF
Feed-through	10 pF
Amplification Factor	24
Base	5-Pin
Recommended Air System Socket	SK-410
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	5.6 in; 14.22 cm
Maximum Diameter	2.75 in; 6.99 cm
Weight (approximate)	1.6 lb; 3.5 kg
Operating Position	Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	7000	0.8	6000	0.65	85	2800

3CW2500C7/YU-157



The 3CW2500C7/YU-157 is a rugged coaxial-base power triode designed for use as a cathode driven Class AB₂ or Class C amplifier.

It is recommended for VHF or UHF service as a linear amplifier, power amplifier, or pulse amplifier. Linearity and power gain are both excellent due to the low ratio of grid to plate current, and the relatively high amplification factor. Low grid interception of available emission current is due to the beam forming geometry of the special grid and cathode design.

CHARACTERISTICS

Plate Dissipation (Max.)	2500 watts
Grid Dissipation (Max.)	20 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Liquid
Cathode	Oxide-coated Unipotential
Voltage	5.0 volts
Current	10.5 amperes
Capacitances (Gnd. Grid Connection)	
Input	35.5 pF
Output	12.4 pF
Feed-through	0.14 pF
Amplification Factor	125
Transconductance	55,000 μ mhos
Base	Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	3.68 in; 9.34 cm
Maximum Diameter	2.25 in; 5.72 cm
Weight (approximate)	1.34 lb; 0.6 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier at 400 MHz	4000	1.0	3000	1.0	83	1570†
AB ₂	Cathode Driven RF Linear Amplifier up to 30 MHz	4000	1.0	3500	0.97	50	2030†

†Useful Power Output

3CW2500D3



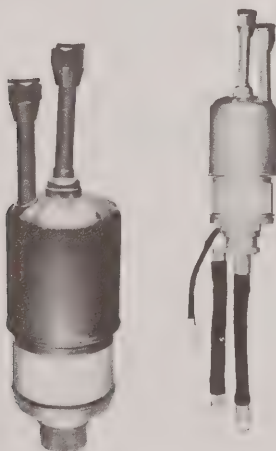
The 3CW2500D3 is a medium- μ , water-cooled power triode intended for use in amplifier, oscillator or modulator service. Maximum anode dissipation of the tube is 3,000 watts. This tube is a version of the air-cooled 3CX2500D3 and is recommended for industrial applications where reserve anode dissipation is required.

CHARACTERISTICS

Plate Dissipation (Max.)	3000 watts
Grid Dissipation (Max.)	75 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	31.0 amperes
Capacitances (Grounded Cathode Connection)	
Input	20.39 pF
Output	0.89 pF
Feed-through	9.03 pF
Amplification Factor	24
Base	3-Pin Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	7.6 in; 19.30 cm
Maximum Diameter	2.5 in; 6.35 cm
Weight (approximate)	2.2 lb; 1.0 kg
Operating Position	Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	7000	1.5	6000	1.21	165	5270

3CW5000A3/8242, 3CW5000F3/8243



3CW5000A3/8242, 3CW5000F3/8243

The 3CW5000A3/8242 and 3CW5000F3/8243 are medium- μ power triodes intended for use in amplifier, oscillator, or modulator service. Their maximum rated anode dissipation is 5000 watts.

These tubes are water-cooled versions of the air-cooled 3CX2500A3/8161 and 3CX2500F3/8251.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 watts
Grid Dissipation (Max.)	150 watts
Frequency for Max. Ratings (CW)	75 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	51.5 amperes
Capacitances (Grounded Cathode Connection)	
Input	35.0 pF
Output	0.9 pF
Feed-through	20.0 pF
Amplification Factor	22
Transconductance†	20,000 μ mhos
Base:	
(3CW5000A3/8242)	Coaxial
(3CW5000F3/8243)	Flexible Filament Leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	
(3CW5000A3/8242)	12.62 in; 320.50 mm
(3CW5000F3/8243)	22.06 in; 560.30 mm
Maximum Diameter (both types)	3.63 in; 92.10 mm
Weight (approximate):	
(3CW5000A3/8242)	4.8 lb; 2.2 kg
(3CW5000F3/8243)	6.0 lb; 2.7 kg
Operating Position	Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	6000	2.5	6000	2.1	136	10,000
C	Grid Driven RF Amplifier Plate Modulated	5000	2.0	5000	1.5	76	5580
AB ₂	Grid Driven AF Amplifier or Modulator	6000	2.5	6000	3.0*	113	13,000*
AB ₂	Grid Driven AF Amplifier or Modulator	6000	2.5	5000	2.3*	59	8000*

*Two tubes

†At $I_b = 0.83$ A

3CW5000F1/8241

The 3CW5000F1/8241 is a low- μ power triode intended for use as audio amplifiers or modulators. The maximum rated plate dissipation is 5000 watts.

Two tubes in Class AB₁ audio service will deliver more than 10 kW maximum-signal plate output power at 6000 plate volts without drawing grid current.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 watts
Grid Dissipation (Max.)	50 watts
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	50.5 amperes
Amplification Factor	4.9
Transconductance†	11,000 μ hos
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	22.06 in; 560.30 mm
Maximum Diameter	3.63 in; 92.10 mm
Weight (approximate)	6.0 lb; 2.7 kg
Operating Position	Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	Grid driven AF Amplifier or Modulator	6000	2.5	6000	2.7*	0	10,000*

*Two tubes

†At $I_b = 1.0$ A

3CW5000H3

The 3CW5000H3 is a medium- μ power triode designed primarily for use in industrial radio-frequency heating services.

Input of 12.5 kW is permissible up to 75 MHz. The grid structure is rated at 150 watts making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 watts
Grid Dissipation (Max.)	150 watts
Frequency for Max. Ratings (CW)	75 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	51.5 amperes
Capacitances (Grounded Cathode Connection)	
Input	35.0 pF
Output	0.9 pF
Feed-through	20.0 pF
Amplification Factor	20
Transconductance†	20,000 μ hos
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	18.56 in; 471.40 mm
Maximum Diameter	5.42 in; 137.70 mm
Weight (approximate)	7.5 lb; 3.4 kg
Operating Position	Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	6000	2.5	6000	2.1	136	10,000

†At $I_b = 0.83$ A.

3CW7000H3/Y-842A



The 3CW7000H3/Y-842A is a medium-mu, water-cooled power triode intended for use in amplifier, oscillator or modulator service. Maximum anode dissipation of the tube is 7,000 watts. This tube is a version of the air-cooled YU-108 and is recommended for industrial applications where reserve anode dissipation is required.

CHARACTERISTICS

- Plate Dissipation (Max.) 7000 watts
 - Grid Dissipation (Max.) 300 watts
 - Frequency for Max. Ratings (CW) 75 MHz
 - Cooling Water and Forced Air
 - Filament Thoriated Tungsten
 - Voltage 7.0 volts
 - Current 78.0 amperes
 - Capacitances (Gnd. Cath. Connection)
 - Input 35.0 pF
 - Output 0.9 pF
 - Feed-through 20.0 pF
 - Amplification Factor 22
 - Transconductance 20,000 μ mhos
 - Base Flexible leads
 - Maximum Seal & Anode Core Temperature 250°C
 - Maximum Length* 12.56 in; 31.9 cm
 - Maximum Diameter 3.63 in; 9.22 cm
 - Weight (approximate) 4.4 lb; 2.0 kg
 - Operating Position Vertical, base up
- *Excluding leads

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	9000	3.0	8000	2.75	710	15,000

3CW7000F7/YU-106



The EIMAC 3CW7000F7/YU-106 is a ceramic/metal, water-cooled, high-mu triode for use as an amplifier, oscillator, or modulator, or in voltage regulator applications. Its maximum rated anode dissipation is 7,000 watts.

The 3CW7000F7/YU-106 is a water-cooled version of the air-cooled 3CX3000F7, and is identical except for the addition of flexible leads on the base for grid and filament connections, which can simplify socketing in low-frequency operations.

Operation with zero grid bias in many applications offers circuit simplicity by eliminating the bias supply. Grounded-grid operation is attractive since a power gain of over 20 times can be obtained.

CHARACTERISTICS

- Plate Dissipation (Max.) 7000 watts
 - Grid Dissipation (Max.) 225 watts
 - Frequency for Max. Ratings (CW) 75 MHz
 - Cooling Water and Forced Air
 - Filament Thoriated Tungsten
 - Voltage 7.5 volts
 - Current 51.5 amperes
 - Capacitances (Grounded Cathode Connection)
 - Input 38.0 pF
 - Output 0.6 pF
 - Feed-through 24.0 pF
 - Amplification Factor 160
 - Base Flexible leads
 - Maximum Seal & Anode Core Temperature 250°C
 - Maximum Length* 12.56 in; 31.9 cm
 - Maximum Diameter 3.63 in; 9.22 cm
 - Weight (approximate) 4.1 lb; 1.9 kg
 - Operating Position Vertical, base up
- *Excluding leads

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator or Amplifier	5000	2.5	4800	1.5	435	5500

3CW10,000H3

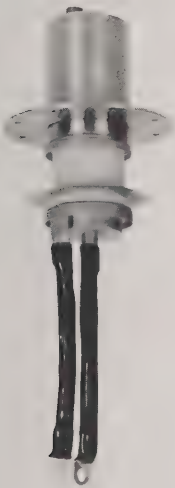
The 3CW10,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 30 kW is permissible up to 90 MHz. The grid structure is rated at 150 watts making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	10,000 watts
Grid Dissipation (Max.)	150 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	75.5 amperes
Capacitances (Grounded Cathode Connection)	
Input	51.0 pF
Output	1.5 pF
Feed-through	25.0 pF
Amplification Factor	20
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	18.75 in; 476.20 mm
Maximum Diameter	6.80 in; 172.70 mm
Weight (approximate)	10 lb; 4.53 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	10,000	3.0	9000	2.9	—	20,600

3CW15,000D3

The 3CW15,000D3 is a medium-mu air and water power triode designed primarily for use in industrial RF heating service.

This tube is interchangeable with the ITK12-1 in most applications.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 Watts
Grid Dissipation (Max.)	350 Watts
Frequency for Max. Ratings (CW)	120 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	5.8 volts
Current	145 amperes
Capacitances (Grounded Cathode Connection)	
C _{in}	47.0 pF
C _{out}	1.0 pF
C _{gp}	21.0 pF
Amplification Factor	22
Base	Flexible filament leads
Maximum Seal and Anode Core Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	9.85 in; 250 mm
Maximum Diameter	6.1 in; 155 mm
Weight (approximate)	10 lb; 4.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (Watts)	Output Power (Watts)
C	RF Power Amplifier or Oscillator	12,000	5	8000	4.5	550	26,000

3CW20,000A3



The 3CW20,000A3 is a medium- μ power triode intended primarily for use as a power oscillator in industrial heating applications. It is also recommended for use as a conventional plate-modulated amplifier, or as a linear amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Grid Dissipation (Max.)	250 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	53.0 pF
Output	1.4 pF
Feed-through	34.0 pF
Amplification Factor	20
Base	Coaxial
Recommended Air System Socket	SK-1300
Maximum Seal Temperature	250°C
Maximum Length:	11.22 in; 285.00 mm
Maximum Diameter:	4.65 in; 118.10 mm
Weight (approximate)	11.5 lb; 5.2 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Cathode Driven RF Amplifier	7000	4.0	7000	4.0	4100	24,500
C	Grid Driven RF Amplifier Plate Modulated	5500	3.0	5000	3.0	515	12,400
C	RF Industrial Oscillator	7000	4.0	7000	4.0	—	22,400
AB ₂	Cathode Driven RF Linear Amplifier	7000	5.0	7000	4.0	2050	20,000

3CW20,000A7



The 3CW20,000A7 is a high- μ power triode intended to be used as a zero-bias Class-B amplifier in audio or radio-frequency applications. Operation with zero grid bias offers circuit simplicity by eliminating the bias supply. In addition, grounded-grid operation is attractive since a power gain as high as twenty times can be obtained.

The 3CW20,000A7 is electrically identical to the air-cooled 3CX10,000A7 except for its 20kW plate dissipation rating.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	59.0 pF
Output	0.2 pF
Feed-through	36.0 pF
Capacitances (Gnd. Grid Connection)	
Input	59.0 pF
Output	36.0 pF
Feed-through	0.2 pF
Amplification Factor	200
Base	Coaxial
Recommended Air System Socket	SK-1300
Maximum Seal Temperature	250°C
Maximum Length:	11.22 in; 285.00 mm
Maximum Diameter:	4.65 in; 118.10 mm
Weight (approximate)	11.5 lb; 5.2 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	7000	4.0	7000	4.0	530	21,300
C	Grid Driven RF Amplifier Plate Modulated	5500	3.0	5000	3.0	380	11,900
B	Cathode Driven RF Linear Amplifier	7000	5.0	7000	5.0	1540	24,200
B	Cathode Driven RF Linear Amplifier (AM Service)	7000	5.0	7000	2.4	330	5650†
B	Grid Driven AF Amplifier or Modulator	7000	5.0	7000	10.0*	560	47,700*

*Two tubes.

†Carrier Power.

3CW20,000H3

The 3CW20,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 40 kilowatts is permissible up to 90 MHz. The grid structure is rated at 250 watts, making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Grid Dissipation (Max.)	250 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	53.0 pF
Output	1.4 pF
Feed-through	34.0 pF
Amplification Factor	20
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	18.25 in; 463.50 mm
Maximum Diameter:	6.75 in; 171.40 mm
Weight (approximate)	12.0 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	12,000	4.0	10,000	4.0	340	28,000

3CW20,000H7

The 3CW20,000H7 is a high-mu power triode intended for use as a dc voltage or current regulator, or in high-voltage switch tube or pulsed regulator service.

In addition, since the tube is identical to the 3CW20,000A7 except for the anode and grid flanges and the addition of the filament flying leads, it is useful as a zero-bias Class B amplifier in audio or RF applications.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	99.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	59.0 pF
Output	0.2 pF
Feed-through	36.0 pF
Amplification Factor	200
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	20.70 in; 525.80 mm
Maximum Diameter:	6.75 in; 171.40 mm
Weight (approximate)	12 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	Cathode Driven RF Linear Amplifier	7000	5.0	7000	5.0	1540	24,200
AB	Cathode Driven RF Linear Amplifier (AM Service)	7000	5.0	7000	2.4	330	5650†
AB	Grid Driven AF Amplifier or Modulator	7000	5.0	7000	10.0*	560	47,700*

*Two tubes.

†Carrier Power.

3CW30,000H3



The 3CW30,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 60 kW is permissible from its one kilowatt filament. The grid structure is rated at 500 watts making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	30,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	53.0 pF
Output	1.4 pF
Feed-through	34.0 pF
Amplification Factor	20
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	20.60 in; 523.24 mm
Maximum Diameter:	6.75 in; 171.40 mm
Weight (approximate)	12 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	12,000	6.0	10,000	6.0	365	42,000

3CW30,000H7



The 3CW30,000H7 is a high-mu power triode designed for use as a zero-bias Class B RF amplifier, Class C power amplifier or oscillator, or for voltage regulator service.

Input of 48 kW is permissible up to 110 MHz. Plentiful reserve emission is available from its one kilowatt filament.

Class B operation with zero grid bias offers circuit simplification by eliminating the bias supply.

CHARACTERISTICS

Plate Dissipation (Max.)	30,000 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	56.0 pF
Output	0.2 pF
Feed-through	36.0 pF
Capacitances (Gnd. Grid Connection):	
Input	56.0 pF
Output	36.0 pF
Feed-through	0.2 pF
Amplification Factor	200
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length:	20.6 in; 524 mm
Maximum Diameter:	6.75 in; 171.40 mm
Weight (approximate)	12.0 lb; 5.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Power Amplifier	8000	5.0	7000	4.0	430	21,300
AB	Cathode Driven RF Linear Amplifier	8000	6.0	7000	5.0	1540	24,200
A	Voltage Regulator	28,000	6.0	—	—	—	—

3CW40,000A5

The 3CW40,000A5 is a medium-mu power triode designed primarily for use as an RF power amplifier. Input of 100 kW is permissible up to 90 MHz. Plentiful reserve emission is available from its 1500-watt filament. The grid structure is rated at 1000 watts dissipation.

The electrical characteristics of the 3CW40,000A5 closely match those of the Siemens RS-2021W and it is therefore ideal as a retrofit.

CHARACTERISTICS

Plate Dissipation (Max.)	40,000 watts
Grid Dissipation (Max.)	1,000 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	12.0 volts
Current	120 amperes
Capacitances (Gnd. Cath. Connection)	
Input	70.0 pF
Output	2.3 pF
Feed-through	43.0 pF
Amplification Factor	55
Base	Special, Coaxial
Recommended Air System Socket	SK-1300 Family
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	12.0 in; 304.8 mm
Maximum Diameter	6.75 in; 171.5 mm
Weight (approximate)	17 lb; 7.7 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier	12,000	9.0	10,000	7.0	800	60,000

3CW40,000H3

The 3CW40,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 100 kW is permissible up to 90 MHz. Plentiful reserve emission is available from its 1500-watt filament. The grid structure is rated at 750 watts, making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	40,000 watts
Grid Dissipation (Max.)	750 watts
Frequency for Max. Ratings (CW)	90 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	70.0 pF
Output	2.3 pF
Feed-through	43.0 pF
Amplification Factor	20
Base	Flexible filament leads
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	21.23 in; 539.20 mm
Maximum Diameter	6.75 in; 171.40 mm
Weight (approximate)	14 lb; 6.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	12,000	9.0	10,000	9.0	1040	70,000

3CW45,000H3



Tube shown with SK1360 water jacket

The 3CW45,000H3 is a medium-mu power triode designed primarily for use in industrial radio-frequency heating services.

Input of 150 kW is permissible up to 75 MHz. Plentiful reserve emission is available from its 1600-watt filament. The grid structure is rated at 750 watts, making this tube an excellent choice for severe applications.

The anode cooling jacket is removeable, thus facilitating cleaning the water passages from build up of sediment which occurs in some applications where water of proper purity is not available.

CHARACTERISTICS

Plate Dissipation (Max.)	45,000 watts
Grid Dissipation (Max.)	750 watts
Frequency for Max. Ratings (CW)	75 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	70.0 pF
Output	2.3 pF
Feed-through	43.0 pF
Amplification Factor	30
Base	Flexible filament leads
Anode Water Jacket	SK1360
Maximum Seal Temperature	250°C
Maximum Flexible Lead Temperature	175°C
Maximum Length	19.2 in; 487.7 mm
Maximum Diameter	5.3 in; 134.6 mm
Weight (approximate)	14 lb; 6.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Industrial Oscillator	14,000	11.5	13,000	11.5	1450	120,000

3CW150,000H3



The 3CW300,000H3 is a medium-mu triode designed for industrial radio-frequency service.

Input of 900 kW is permissible up to 30 MHz. Reserve emission is available from its 8000-watt filament, which is water cooled. The grid structure is rated for 4000 watts, making this tube an excellent choice for severe applications.

CHARACTERISTICS

Plate Dissipation (Max.)	150,000 watts
Grid Dissipation (Max.)	1,500 watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	312 amperes
Capacitances (Gnd. Cath. Connection)	
Input	156 pF
Output	4.4 pF
Feed-through	94 pF
Amplification Factor	25
Base	Special
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	20.4 in; 51.8 cm
Maximum Diameter	9.5 in; 24.1 cm
Weight (approximate)	49 lb; 22.2 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kw)
C	RF Industrial Oscillator†	18,000	18.0	16,000	13.0	3000	173

†3-phase, full-wave rectified unfiltered power supply



The 8972 is a medium- μ triode designed for very-high-power medium-frequency or high-frequency broadcast service and very-low-frequency communication in the megawatt power range.

The 8972 has a two-section thoriated-tungsten filament mounted on water-cooled supports. The two sections may be fed in quadrature to reduce hum contributed by an ac power source. The maximum anode dissipation rating is 1500 kW steady state.

Large-diameter coaxial terminals are used for the control grid and the RF filament terminals. Filament power and filament support cooling-water connections are made through three special couplings with threaded clamping rings.

CHARACTERISTICS

Plate Dissipation (Max.)	1,500,000 watts
Grid Dissipation (Max.)	12,000 watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	16.3 volts
Current	640 amperes
Capacitances (Grounded Cath. Connection)	
Input	900 pF
Output	25.0 pF
Feed-through	350 pF
Amplification Factor	23
Base	Special
Recommended Cooling Water/Filament	
Power Connector (3 required)	SK-2310
Recommended RF Return Connector	SK-2315
Recommended Anode Water Connectors	SK-2322
Maximum Seal and Envelope Temperature	200°C
Maximum Length	25.31 in; 642.90 mm
Maximum Diameter	17.03 in; 432.60 mm
Weight (approximate)	190 lb; 87 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (kW)	Output Power (kW)
C	RF Power Amplifier or Oscillator	20,000	200	18,000	110	30.0	1500
				15,500	110	32.0	1300

The 8972 is a member of Varian's EIMAC Megawatt family of "Super Power" Power Grid Tubes. In view of the value of these tubes, Varian engineers have chosen to equip each member of this family with an extra device which provides both a diagnostic and a system interlock: ie, a device which assists the user in achieving optimum performance and in preventing serious tube damage. The addition of a mini (-0.1 l/s) Vac-Ion pump allows the user to determine the effect of a specific set of operating conditions on the tube's vacuum. A change in operating conditions accompanied by an increase in pressure indicates that the new operating conditions caused an increase in temperature of one or more of the tube's components; the degree and rate of pressure increase can be used to determine what action should be taken to avoid damage to the tube.

3-500Z



The 3-500Z is intended for use as a zero-bias Class B amplifier in audio or radio frequency applications, or in Class C service.

Operation with zero grid bias simplifies associated circuitry by eliminating the bias supply, and grounded grid operation is attractive since a power gain as high as twenty times can be obtained with this tube in a cathode-driven circuit.

CHARACTERISTICS

- Plate Dissipation (Max.) 500 Watts
- Grid Dissipation (Max.) 20 Watts
- Frequency for Max. Ratings (CW) 110 MHz
- Cooling Radiation and Forced Air
- Filament Thoriated-Tungsten
 - Voltage 5.0 volts
 - Current 14.6 amperes
- Capacitances (Grounded Grid Connection)
 - Input 8.3 pF
 - Output 4.7 pF
 - Feed-through 0.1 pF
- Amplification Factor 130
- Base 5-Pin Special
- Recommended Air System Socket SK-410
- Recommended Air Chimney SK-406
- Recommended Heat Dissipating Connector HR-6
- Maximum Plate Seal Temperature 225°C
- Maximum Base Seal Temperature 200° C
- Maximum Length 6.1 in; 154.94 mm
- Maximum Diameter 3.44 in; 87.40 mm
- Weight (approximate) 7.0 oz; 198.0 gm
- Operating Position Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid driven RF Amplifier	4000	0.35	3000	0.35	14	720†
C	Grid driven RF Amplifier Plate Modulated	3000	0.27	3000	0.27	25	640
C	Cathode driven RF Linear Amplifier	4000	0.40	3000	0.33	35	700†
AB ₂	Cathode driven RF Linear Amplifier	4000	0.40	3000	0.40	46	740†
AB ₂	Grid driven AF Amplifier or Modulator	4000	0.40	3000	0.77*	25	1420*

*Two tubes.

†Useful Power Output.

3-1000H

The 3-1000H is a medium-mu triode designed for use in industrial heating services.

CHARACTERISTICS

- Plate Dissipation (Max.) 1000 Watts
- Grid Dissipation 50 Watts
- Cooling Radiation and Forced Air
- Filament Thoriated-Tungsten
 - Voltage 7.5 volts
 - Current 20.0 amperes
- Capacitances (Grounded Cathode Connection)
 - Input 16.0 pF
 - Output 0.5 pF
 - Feed-through 8.0 pF
- Amplification Factor 25
- Base 5-Pin Special
- Recommended Air System Socket SK-510
- Recommended Air Chimney SK-516
- Recommended Heat Dissipating Connector HR-8
- Maximum Plate Seal Temperature 225°C
- Maximum Base Seal Temperature 200° C
- Maximum Length 7.88 in; 200.20 mm
- Maximum Diameter 5.25 in; 133.4 mm
- Weight (approximate) 1.2 lb; 0.54 kg
- Operating Position Vertical, base up or down



Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Oscillator	6000	0.70	6000	0.70	—	3200

3-1000Z/8164



The 3-1000Z/8164 is intended for use as a Class B amplifier in either the grid or cathode-driven connection, for Class C amplifier service, or as Class B audio amplifiers or modulators. At a plate voltage of 3000 volts, 2 kW PEP input can be run with a single 3-1000Z, providing a power gain of over 20 in a cathode-driven circuit.

CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Grid Dissipation (Max.)	50 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	20.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	17.0 pF
Output	0.2 pF
Feed-through	7.5 pF
Capacitances (Gnd. Grid Connection):	
Input	17.0 pF
Output	7.5 pF
Feed-through	0.2 pF
Amplification Factor	200
Base	5 Pin Special
Recommended Air-System Socket	SK-510
Recommended Air Chimney	SK-516
Recommended Heat Dissipating Connector	HR-8
Maximum Plate Seal Temperature	225°C
Maximum Base Seal Temperature	200°C
Maximum Length:	7.88 in; 200.20 mm
Maximum Diameter:	5.25 in; 133.40 mm
Weight (approximate)	1.2 lb.; 0.54 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid driven RF Amplifier	6000	0.70	6000	0.70	57	3200
C	Grid driven RF Amplifier Plate Modulated	4500	0.55	4500	0.50	35	1765
B	Cathode driven RF Linear Amplifier	6000	0.80	3000	0.67	47	1080
B	Grid driven AF Amplifier or Modulator	6000	0.80	5000	1.0*	28	3560*

*Two tubes.

5867A



The 5867A is intended for use in industrial heating applications. The large heat storage capacity of the graphite anode aids in compensating for the wide variations in load generally associated with this type of service. The 5867A is also suitable for use as a RF or AF power amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	350 watts
Grid Dissipation (Max.)	30 watts
Frequency for Max. Ratings (CW)	50 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.5 amperes
Capacitances (Gnd. Cath. Connection)	
Input	7.5 pF
Output	0.5 pF
Feed-through	6.2 pF
Amplification Factor	25
Transconductance	5,000 μ mhos
Base	5-Pin Special
Recommended Air System Socket	SK-410
Recommended Air Chimney	SK-406
Maximum Seal & Anode Core Temperature	220°C
Maximum Length	5.88 in; 149.3 mm
Maximum Diameter	3.44 in; 87.4 mm
Weight (approximate)	6 oz; 168 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Oscillator or Amplifier	4000	0.4	4000	0.38	40	1200
C	RF Industrial Oscillator†	3800	0.36	3500	0.33	—	1100
C	RF Industrial Oscillator*	4500#	0.21	4000#	0.19	—	630

†Industrial application. Single phase, full wave unfiltered plate supply

*Self-rectified

#r.m.s.



The 3X600/Y-872 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact, high vacuum, radial-beam triode is recommended for use in new equipment where high voltage, high current, or high duty factor is encountered.

CHARACTERISTICS

Plate Dissipation (Max.)	600 Watts
Grid Dissipation (Max.)	20 Watts
Frequency for Max Ratings (CW)	110 MHz
Cooling	Radiation and Forced Air
Filament	Thoriated-Tungsten
Voltage	5.0 volts
Current	14.6 amperes
Capacitances (Grounded Cathode Connection)	
Input	8.0 pF
Output	0.12 pF
Feed-through	4.1 pF
Amplification Factor	200
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Air-Chimney	SK-526
Maximum Plate Seal Temperature	250°C
Maximum Base Seal Temperature	250°C
Maximum Length	6.1 in; 15.5 cm
Maximum Diameter	3.7 in; 9.4 mm
Weight (approximate)	28.3 lb; 12.8 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
—	Switch Tube or Pulse Modulator	45,000	5.2	35,000	0.25	30	8750

YU-136



The YU-136 beam power planar tetrode has been specifically designed for high voltage series regulator or switch tube (modulator) service. The compact, rugged design has very low internal inductance and capacitance to improve rise and fall times for very short pulse applications. This tube can be mounted in any operating position and is capable of sustaining vibration and shock.

CHARACTERISTICS

Plate Dissipation Dissipation of 500 watts in oil
can be achieved using appropriate heat sink.
Grid Dissipation (Max.) 3.5 watts
Screen Dissipation (Max.) 7.0 watts
Cooling Oil and Heat Sink
Cathode Tungsten Matrix
Voltage 6.3 volts
Current 8.4 amperes
Capacitances (Grounded Grid Connection)
Input 40.0 pF
Output 5.5 pF
Cgp 0.05 pF
Base Special
Maximum Seal & Anode Core Temperature 250°C
Maximum Length 3.20 in; 81.28 mm
Maximum Diameter 3.05 in; 77.47 mm
Weight (approximate) 1.25 lb; 0.567 kg*
Operating Position Any

* Weight without radiator

MAXIMUM RATINGS				
Peak Plate Voltage (kV)*	DC Plate Voltage (kV)*	DC Screen Voltage (kV)	Pulse Cathode Current (A)	Duty
60	55	4	20	0.10

* In oil and in conjunction with EIMAC 171104 corona shield.

YU-140



The YU-140 beam power planar tetrode has been specifically designed for high voltage series regulator or switch tube (modulator) service. The compact, rugged design has very low internal inductance and capacitance to improve rise and fall times for very short pulse applications. This tube is capable of sustaining vibration and shock. The YU-140 is a hybrid planar tetrode with a fine-mesh control grid and a beam power screen grid. The YU-140 has high transconductance and an arc-resistant screen.

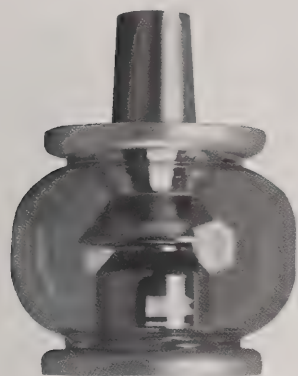
CHARACTERISTICS

Plate Dissipation Dissipation of 10,000 watts in oil
can be achieved using appropriate heat sink.
Grid Dissipation (Max.) 2.0 watts
Screen Dissipation (Max.) 7.0 watts
Cooling Oil and Heat Sink
Cathode Tungsten Matrix
Voltage 6.3 volts
Current 8.4 amperes
Capacitances (Grounded Grid Connection)
Input 45.0 pF
Output 5.5 pF
Cgp 0.05 pF
Base Special
Maximum Seal & Anode Core Temperature 250°C
Maximum Length 9.40 in; 239 mm
Maximum Diameter 7.56 in; 192 mm
Weight (approximate) 7.25 lb; 3.3 kg*
Operating Position Any

* Weight without corona rings and radiator

MAXIMUM RATINGS		
Peak Plate Voltage (kV)†	DC Screen Voltage (kV)	Pulse Cathode Current (A)
100	2	20

† In oil and in conjunction with EIMAC 165374 corona rings.



The YU-146 planar tetrode has been specifically designed for high voltage series regulator or switch tube (modulator) service. The compact, rugged design has very low internal inductance and capacitance to improve rise and fall times for very short pulse applications. The tube can be mounted in various operating positions and is capable of enduring substantial vibration and shock.

CHARACTERISTICS

Plate Dissipation Dissipation of 10,000 watts in oil
can be achieved using appropriate heat sink.
Grid Dissipation (Max.) 2.0 watts
Screen Dissipation (Max.) 7.0 watts
Cooling Oil and Heat Sink
Cathode Tungsten Matrix
Voltage 6.3 volts
Current 8.4 amperes
Capacitances (Grounded Grid Connection)
Input 45.0 pF
Output 5.5 pF
Cgp 0.05 pF
Base Special
Maximum Envelope Temperature 150°C
Maximum Seal & Anode Core Temperature 250°C
Maximum Length 9.40 in; 239 mm
Maximum Diameter 7.56 in; 192 mm
Weight (approximate) 7.25 lb; 3.3 kg*
Operating Position Any

* Weight without corona rings and radiator

MAXIMUM RATINGS		
Peak Plate Voltage (kV)†	DC Screen Voltage (kV)	Pulse Cathode Current (A)
175	2	20

† In oil and in conjunction with EIMAC 165374 corona rings.

4CPX250K/8590



The 4CPX250K/8590 is intended for wideband grid-pulsed radio frequency amplifier and pulse modulator service.

The 4CPX250K/8590 is capable of delivering pulse output power in excess of 10 kW with 10 dB gain when cathode driven at 450 MHz.

The tube is of coaxial construction and especially designed for cavity operation.

CHARACTERISTICS

Plate Dissipation (Max.)	250 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	2 watts
Frequency for Max. Ratings	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	2.7 amperes
Capacitances (Gnd. Grid Connection):	
Input	14.0 pF
Output	4.1 pF
Feed-through	0.006 pF
Amplification Factor (g_1-g_2)	5
Base	Coaxial
Recommended Air System Socket	Special, collets available
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.81 in; 71.40 mm
Maximum Diameter:	1.64 in; 41.60 mm
Weight (approximate)	4 oz; 114 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	2500	0.25	2500	250	0.25	2.8	500
C or B	RF Amplifier	5500	6.0†	5500	1000†	—	1000†	10,000‡
—	Grid and Screen Pulsed at 500 MHz							
—	Switch Tube or Pulse Modulator	7000	6.0†	6000	750	3.5†	—	17,500†

† Pulse value

‡ Useful Power Output



The 4CX250B/7203 and 4CX250FG/8621 have a maximum plate dissipation rating of 250 watts and a maximum input-power rating of 500 watts. The 4CX250B/7203 is designed to operate with a heater voltage of 6.0 volts, while the 4CX250FG/8621 is designed for operation at a heater voltage of 26.5 volts. Otherwise, the two tube types have identical characteristics.

4CX250B/7203, 4CX250FG/8621

CHARACTERISTICS

Plate Dissipation (Max.)	250 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	.2 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage (4CX250B/7203)	6.0 volts
(4CX250FG/8621)	26.5 volts
Current (4CX250B/7203)	2.6 amperes
(4CX250FG/8621)	0.54 amperes
Capacitances (Gnd. Cath. Connection):	
Input	15.7 pF
Output	4.5 pF
Feed-through	0.04 pF
Capacitances (Gnd. Grid Connection):	
Input	13.0 pF
Output	4.5 pF
Feed-through	0.01 pF
Amplification Factor ($g_1 - g_2$)	.5
Base	9-Pin Special
Recommended Air-System Socket	SK-600A
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.46 in; 62.50 mm
Maximum Diameter	1.64 in; 41.70 mm
Weight (approximate)	.4 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier up to 175 MHz	2000	0.25	2000	300	0.25	2.9	390
C	RF Amplifier Plate Modulated up to 175 MHz	1500	0.20	1500	250	0.20	1.7	235
AB ₁	RF Linear Amplifier up to 175 MHz	2000	0.25	2000	350	0.25	—	300
AB ₁	RF Linear Amplifier (AM Service) up to 175 MHz	2000	0.25	2000	350	0.15	—	65†
AB ₁	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	600*

*Two tubes

† Carrier Power

4CX250BC/8957

The 4CX250BC/8957 is especially recommended as a premium-quality replacement for the 4CX250B/7203, in applications where long life and consistent performance are of prime concern and the closer heater voltage tolerance and increased cathode warmup time are acceptable.

CHARACTERISTICS

Plate Dissipation (Max.)	250 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	2 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	2.4 amperes
Capacitances (Gnd. Grid Connection):	
Input	15.7 pF
Output	4.5 pF
Feed-through	0.04 pF
Capacitances (Gnd. Grid Connection):	
Input	13.0 pF
Output	4.5 pF
Feed-through	0.01 pF
Amplification Factor ($g_1 - g_2$)	5
Base	9-Pin Special
Recommended Air-System Socket	SK-600A
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.46 in; 62.50 mm
Maximum Diameter:	1.64 in; 41.70 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier up to 175 MHz	2000	0.25	2000	300	0.25	2.9	390
C	RF Amplifier Plate Modulated up to 175 MHz	1500	0.20	1500	250	0.20	1.7	235
AB ₁	RF Linear Amplifier up to 175 MHz	2000	0.25	2000	350	0.25	—	300
AB ₁	RF Linear Amplifier up to 175 MHz (AM Service)	2000	0.25	2000	350	0.15	—	65†
AB ₁	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	600*

*Two tubes.

†Carrier Power

4CX250K/8245, 4CX250M/8246



The 4CX250K/8245 and 4CX250M/8246 have a maximum plate dissipation rating of 250 watts and a maximum input-power rating of 500 watts.

All element terminals are coaxial so the tube lends itself to cavity designs for VHF and UHF service.

CHARACTERISTICS

Plate Dissipation (Max.)	250 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	2 watts
Frequency for Max. Ratings (CW)	500 MHz
(Pulsed)	1500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage (4CX250K/8245)	6.0 volts
(4CX250M/8246)	26.5 volts
Current (4CX250K/8245)	2.7 amperes
(4CX250M/8246)	0.5 amperes
Capacitances (Gnd. Cath. Connection):	
Input	27.0 pF
Output	4.7 pF
Feed-through	0.04 pF
Capacitances (Gnd. Grid Connection):	
Input	17.0 pF
Output	4.7 pF
Feed-through	0.01 pF
Amplification Factor ($g_1 - g_2$)	5
Base	Special, Coaxial
Socket	Collets available
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.81 in; 71.40 mm
Maximum Diameter:	1.64 in; 41.70 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier up to 500 MHz	2000	0.25	2000	300	0.25	—	225*
C	RF Amplifier Plate Modulated up to 175 MHz	1500	0.20	1500	250	0.20	1.7	300
C	RF Amplifier Plate and Screen Pulsed at 1200 MHz	7000	7.0†	7000‡	1200‡	6.0	—	17,000§
B	RF Linear Amplifier TV Service up to 216 MHz	2000	0.25	2000	350	0.36	9	440*
AB ₁	RF Linear Amplifier up to 175 MHz	2000	0.25	2000	350	0.25	—	300

* Useful Power Output

† Cathode Current, pulse

‡ Pulse Voltage Values

§ Pulse Power

• Peak of Sync. power

4CX250R/7580W

CHARACTERISTICS

Plate Dissipation (Max.)	250 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	2 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	2.6 amperes
Capacitances (Gnd. Cath. Connection):	
Input	17.5 pF
Output	4.8 pF
Feed-through	0.04 pF
Amplification Factor ($g_1 - g_2$)	5
Base	9-Pin Special
Recommended Air-System Socket	SK-600A
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.46 in; 62.50 mm
Maximum Diameter:	1.64 in; 41.70 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

The 4CX250R/7580W is designed specifically for use in Class AB₁ linear amplifiers where shock and/or vibration preclude the use of nonruggedized tube types. The 4CX250R/7580W will replace the 4CX250B in equipments where the range of bias adjustment will tolerate this higher perveance tube and where tuning range can compensate for the small differences in input and output capacitances.

The 4CX250R/7580W will deliver more output power in most linear amplifiers which presently employ the 4CX250B and it will operate with maximum rated plate and screen voltage applied in equipments where shock and/or vibration is experienced.



Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	2000	0.25	2000	400	0.25	—	300
AB ₁	RF Linear Amplifier (AM Service)	2000	0.25	2000	400	0.17	—	100†
AB ₁	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	595*

*Two tubes.

†Carrier Power

4CX300A/8167

The 4CX300A/8167 is a compact power tetrode having a maximum plate-dissipation rating of 300 watts.

The ceramic/metal construction and the internally unitized electrode structure combine to make the 4CX300A/8167 especially durable and free from mechanically induced noise under conditions of severe acceleration caused by shock or vibration.

CHARACTERISTICS

Plate Dissipation (Max.)	300 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	2 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	2.9 amperes
Capacitances (Gnd. Cath. Connection):	
Input	29.0 pF
Output	4.0 pF
Feed-through	0.04 pF
Amplification Factor ($g_1 - g_2$)	4.8
Transconductance \dagger	12,000 μ mhos
Base	Special, Breechblock
Recommended Air-System Socket	SK-700
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.50 in; 63.50 mm
Maximum Diameter:	1.64 in; 41.60 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

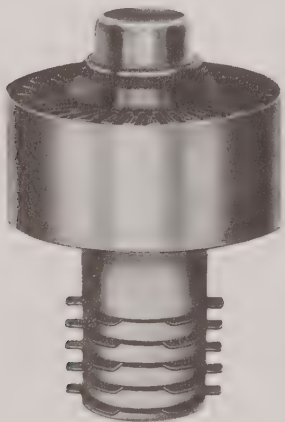
Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	2000	0.25	2000	250	0.25	2.9	390
C	RF Amplifier at 500 MHz	2000	0.25	2000	250	0.25	—	225†
C	RF Amplifier Plate Modulated	1500	0.20	1500	250	0.20	1.7	235
AB ₁	RF Linear Amplifier	2500	0.25	2500	350	0.25	—	400
AB ₁	RF Linear Amplifier (AM Service)	2500	0.25	2500	350	0.15	—	85§
AB ₁	AF Amplifier or Modulator	2500	0.25	2500	350	0.50*	—	800*

* Two tubes

† At $I_b = 200$ mA

‡ Useful Power Output

§ Carrier Power

4CX300Y/8561

The 4CX300Y/8561 is a compact power tetrode having a maximum plate dissipation rating of 400 watts. It may be operated at maximum ratings to 110 MHz.

The ceramic/metal construction and the internally-unitized electrode structure combine to make the 4CX300Y/8561 especially durable and free from mechanically-induced noise under conditions of severe acceleration caused by shock or vibration.

CHARACTERISTICS

Plate Dissipation (Max.)	400 watts
Screen Dissipation (Max.)	8 watts
Grid Dissipation (Max.)	1 watt
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	3.5 amperes
Capacitances (Gnd. Cath. Connection):	
Input	34.0 pF
Output	4.5 pF
Feed-through	0.04 pF
Amplification Factor ($g_1 - g_2$)	5.6
Base	Special, Breechblock
Recommended Air-System Socket	SK-700
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.50 in; 63.50 mm
Maximum Diameter:	1.64 in; 41.60 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	2000	0.40	2000	250	0.40	3.8	600
C	RF Amplifier Plate Modulated	1500	0.30	1500	250	0.30	1.7	300
AB ₁	RF Linear Amplifier	2000	0.40	2000	400	0.38	—	415
AB ₁	RF Linear Amplifier (AM Service)	2000	0.40	2000	400	0.20	—	115†
AB ₁	AF Amplifier or Modulator	2000	0.40	2000	400	0.75*	—	890*

*Two tubes

†Carrier power

4CX350A/8321, 4CX350F/8322

The 4CX350A/8321 and 4CX350F/8322 have a maximum plate dissipation of 350 watts and are intended for Class AB audio or RF amplifier service. The tube is externally identical to the 4CX250B but contains rugged internal construction features. Amplification factor and cathode area have been increased over the basic 4CX250B to give higher transconductance and figure of merit.

CHARACTERISTICS

Plate Dissipation (Max.)	350 Watts
Grid Dissipation (Max.)	0 Watts
Screen Dissipation (Max.)	8 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage:	
(4CX350A/8321)	6.0 Volts
(4CX350F/8322)	26.5 Volts
Current:	
(4CX350A/8321)	2.9 Amperes
(4CX350F/8322)	0.73 Amperes
Capacitances (Grounded Cathode Connection)	
Input	23.6 pF
Output	5.6 pF
Feed-through	0.03 pF
Amplification Factor (g^1 - g^2)	13
Transconductance \dagger	22,000 μ mhos
Base	9-Pin Special
Recommended Air-System Socket	SK-600A
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.47 in; 62.60 mm
Maximum Diameter	1.64 in; 41.60 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	2500	0.30	2200	400	0.29	—	385
AB ₁	AF Amplifier or Modulator	2500	0.30	2200	400	0.58*	—	770*

*Two tubes.

\dagger At $I_b = 150$ mA.

4CX350AC

The 4CX350AC is a compact air-cooled tetrode. This product is intended for use in equipment which normally uses the 4CX350A, and where extended tube life is a concern.

Externally, the 4CX350AC is identical to the 4CX350A. Electrical characteristics are the same in both tube types with the exception that the heater warm-up time is increased to 40 seconds in the 4CX350AC.

CHARACTERISTICS

Plate Dissipation (Max.)	350 Watts
Grid Dissipation (Max.)	0 Watts
Screen Dissipation (Max.)	8 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 Volts
Current	2.9 Amperes
Capacitances (Grounded Cathode Connection)	
Input	23.6 pF
Output	5.6 pF
Feed-through	0.03 pF
Amplification Factor (g^1 - g^2)	13
Transconductance \dagger	22,000 μ mhos
Base	9-Pin Special
Recommended Air-System Socket	SK-600A
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.47 in; 62.60 mm
Maximum Diameter	1.64 in; 41.60 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	2500	0.30	2200	400	0.29	—	385
AB ₁	AF Amplifier or Modulator	2500	0.30	2200	400	0.58*	—	770*

*Two tubes.

\dagger At $I_b = 150$ mA.

4CX350FJ/8904



The 4CX350FJ/8904 is intended for Class AB linear RF amplifier service. The tube has rugged internal construction features.

The 4CX350FJ/8904 may be used as an exact replacement for the 4CX350F/8322 in most applications, requiring only minor circuit adjustment and retuning. The tube has improved intermodulation distortion characteristics. It contains a 26.5 volt heater, and is recommended for new equipment designs.

CHARACTERISTICS

Plate Dissipation (Max.)	350 Watts
Grid Dissipation (Max.)	0 Watts
Screen Dissipation (Max)	8.0 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	26.5 Volts
Current	0.65 Ampere
Capacitances (Grounded Cathode Connection)	
Input	22.0 pF
Output	5.9 pF
Feed-through	0.033 pF
Amplification Factor (g_1^2)	17
Transconductance \dagger	22,000 μ mhos
Base	9-Pin Special
Recommended Air-System Socket	SK-600A
Recommended Air Chimney	SK-606
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.46 in; 62.60 mm
Maximum Diameter	1.64 in; 41.60 mm
Weight (approximate)	4 oz; 113 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	2500	0.30	2200	400	0.23	—	250*

*Useful Power Output.

\dagger At $I_b = 150$ mA.

4CX600F



The 4CX600F is designed for use in wideband amplifiers, particularly distributed amplifiers.

The mechanical and electrical features of these tubes are compatible with wideband amplifier circuit requirements; having low lead inductance, low input and output capacitances, small size and high transconductance.

Rugged construction consisting of a unitized electrode structure and direct mounting to the chassis combine to make the 4CX600F suitable for environments of severe shock and vibration.

CHARACTERISTICS

Plate Dissipation (Max.)	600 Watts
Grid Dissipation (Max.)	3 Watts
Screen Dissipation (Max)	15 Watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	26.5 Volts
Current	1.05 Ampere
Capacitances (Grounded Cathode Connection)	
Input	45.0 pF
Output	5.8 pF
Feed-through	0.15 pF
Input Conductance	
($P = 0.6$ Adc, $f = 30$ MHz)	0.1×10^{-3} mhos
Transconductance	
($I_b = 0.6$ Adc)	41,000 μ mhos
Base	Special
Recommended Screen Bypass Capacitor	SK-680
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.45 in; 62.60 mm
Maximum Diameter	2.08 in; 52.80 mm
Weight (approximate)	7 oz; 198 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	RF Amplifier TV Service at 865 MHz	2500	0.60	2000	300	0.60 \dagger	52 \dagger	585 \dagger
AB	RF Amplifier up to 432 MHz	2500	0.60	1800	300	0.60	25	700*
AB	RF Amplifier at 865 MHz	2500	0.60	2000	300	0.60	52	585*
AB	RF Linear Amplifier Broadband Service	3000	0.60	2500	275	0.59	—	1000

*Useful Power Output.

\dagger Sync. level.

4CX600J/8809, 4CX600JA/8921**CHARACTERISTICS**

Plate Dissipation (Max.)	600 watts
Screen Dissipation (Max.)	15 watts
Grid Dissipation (Max.)	1 watt
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	5.4 amperes
Capacitances (Gnd. Cath. Connection):	
Input	50 pF
Output	6.3 pF
Feed-through	0.13 pF
Transconductance	
($I_b = 0.3 \text{ A dc}$, $E_{c2} = 350 \text{ V dc}$)	27,000 μhos
Base	9-Pin Special
Recommended Air-System Socket	SK-607
Recommended Air Chimney (4CX600J)	SK-646
(4CX600JA)	SK-656
Maximum Seal & Anode Core Temperature	250°C
Maximum Length: (both types)	2.71 in; 68.80 mm
Maximum Diameter: (4CX600J)	2.08 in; 52.80 mm
(4CX600JA)	2.52 in; 64.00 mm
Weight (approximate)	
(4CX600J)	7.7 oz; 218 gm
(4CX600JA)	9.0 oz; 255 gm
Operating Position	Any



The 4CX600J/8809 is a low-voltage, high current tetrode specifically designed for exceptionally low intermodulation distortion and low grid interception.

The 4CX600JA/8921 has a larger anode cooling for reduced cooling air pressure-drop. It is electrically identical to the 4CX600J.

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier up to 30 MHz	3000	0.60	2500	350	0.68†	—	1100‡
AB	AF Amplifier or Modulator	3000	0.60	2800	350	1.1*	—	1985*

*Two tubes.

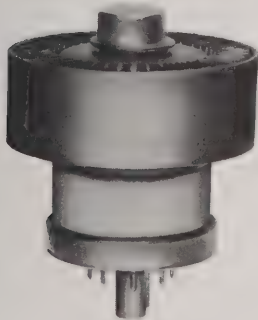
†1-tone value; 2-tone $I_b \approx 0.475 \text{ A}$

‡Useful power output; intermodulation distortion products $\approx -40 \text{ dB}$ in circuit with 11Ω unbypassed cathode resistor.

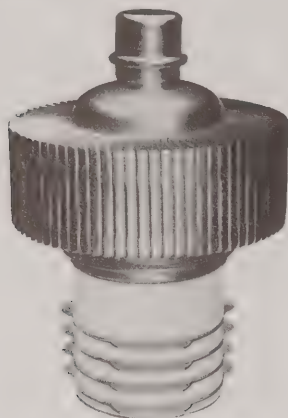
4CX600JB**CHARACTERISTICS**

Plate Dissipation (Max.)	600 watts
Screen Dissipation (Max.)	15 watts
Grid Dissipation (Max.)	1 watt
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	5.4 amperes
Capacitances (Gnd. Cath. Connection):	
Input	50 pF
Output	6.3 pF
Feed-through	.13 pF
Base	9-pin Special
Recommended Air-System Socket	SK-607
Recommended Air Chimney	SK-646
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.71 in; 68.8 mm
Maximum Diameter:	2.08 in; 52.8 mm
Weight (approximate)	7.7 oz; 218 gm
Operating Position	Any

The 4CX600JB is the lower priced version of the highly linear 4CX600J. This type is recommended when operation is to be Class AB₁ or when extra drive power is available for AB₂ operation.



Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	3000	0.60	2000	350	0.50	—	550
AB ₁	RF Linear Amplifier	3000	0.60	2800	350	0.57	—	975

4CX1000A/8168

The 4CX1000A/8168 is a low-voltage, high-current tetrode specifically designed for Class AB₁ RF linear-amplifier or audio-amplifier applications where its high gain may be used to advantage.

CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	1 watt
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	9.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	81.0 pF
Output	11.8 pF
Feed-through	0.015 pF
Capacitances (Gnd. Grid Connection):	
Input	35.5 pF
Output	12.0 pF
Feed-through	0.004 pF
Transconductance†	37,000 μ mhos
Base	Special, Breechblock
Recommended Air-System Socket	SK-800B
Recommended Air Chimney	SK-806
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.80 in; 122.00 mm
Maximum Diameter:	3.37 in; 85.50 mm
Weight (approximate)	27 oz; 0.77 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier at 30 MHz	3000	1.0	3000	325	0.88	—	1630
AB ₁	AF Amplifier or Modulator	3000	1.0	3000	325	1.8*	—	3260*

*Two tubes.

†At $I_b = 1.0$ A.

4CX1000K/8352

The 4CX1000K/8352 is a low-voltage, high-current tetrode, specifically designed for Class AB₁ RF linear-amplifier applications where its high gain and low distortion characteristics may be used to advantage. The 4CX1000K/8352 is similar to the 4CX1000A/8168 but contains a solid screen ring that improves isolation between input and output circuits and permits use of the tube in UHF service.

CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	1 watt
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	9.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	84.0 pF
Output	13.3 pF
Feed-through	0.015 pF
Capacitances (Gnd. Cath. Connection):	
Input	35.0 pF
Output	13.3 pF
Feed-through	0.003 pF
Transconductance†	37,000 μ mhos
Base	Special, Breechblock
Recommended Air-System Socket	SK-820 or SK-830
Recommended Air Chimney	SK-806
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.80 in; 122.00 mm
Maximum Diameter:	3.37 in; 85.50 mm
Weight (approximate)	27 oz; 0.77 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	3000	1.0	3000	325	0.88	—	1630
AB ₁	AF Amplifier or Modulator	3000	1.0	3000	325	1.80*	—	3260*

*Two tubes.

†At $I_b = 1.0$ A.

4CX1500A



The 4CX1500A is a general purpose tetrode for use up to and through VHF. Insulation is ceramic and the thoriated tungsten filament is a rugged mesh design. The screen terminal is a continuous ring which allows good isolation between the plate circuit and the control grid circuit.

The 4CX1500A is recommended for use as a Class C power amplifier, Class B or Class AB₁ linear amplifier as a regulator, and in pulse modulator service.

CHARACTERISTICS

Plate Dissipation (Max.)	1500 Watts
Screen Dissipation (Max.)	75 Watts
Grid Dissipation (Max.)	25 Watts
Frequency for Max. Ratings (CW)	150 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	5.0 volts
Current	38.5 amperes
Capacitances (Grounded Cathode Connection)	
Input	78.0 pF
Output	10.5 pF
Feed-through	0.25 pF
Amplification Factor (g_1g_2)	5.5
Transconductance \dagger	26,000 μ mhos
Base	Special, Breechblock
Recommended Air-System Socket	SK-831
Recommended Air Chimney	SK-806
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	4.90 in; 124.50 mm
Maximum Diameter	3.37 in; 85.60 mm
Weight (approximate)	36 oz; 850 gm
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	5000	1.0	4000	500	0.80	3.6	2500
C	RF Amplifier at 220 MHz	3000	1.0	3000	500	1.0	31.5	1500 \ddagger
C	RF Amplifier Plate Modulated at 30 MHz	3500	0.8	3400	500	0.90	10	2320
AB	RF Linear Amplifier at 30 MHz	4000	1.0	3900	600	0.75	—	1850
AB	AF Amplifier or Modulator	4000	1.0	3900	600	1.5*	—	3700*

*Two tubes.

\dagger At $I_b = 1.0$ A.

\ddagger Useful power output.

4CX1500B/8660



The 4CX1500B/8660 is a low-voltage, high-current tetrode specifically designed for exceptionally low intermodulation distortion and low grid interception. The low distortion characteristics make the 4CX1500B/8660 especially suitable for radio-frequency and audio-frequency linear amplifier service.

CHARACTERISTICS

Plate Dissipation (Max.)	1500 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	1 watt
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	10.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	81.5 pF
Output	11.8 pF
Feed-through	0.02 pF
Transconductance \dagger	30,000 μ mhos
Base	Special, Breechblock
Recommended Air-System Socket	SK-800B
Recommended Air Chimney	SK-806
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.80 in; 121.90 mm
Maximum Diameter:	3.37 in; 85.60 mm
Weight (approximate)	27 oz; 0.77 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier	3000	0.90	2900	225	0.71	—	1100 \ddagger
AB ₁	AF Amplifier or Modulator	3000	0.90	2900	325	1.7*	—	2774*

*Two tubes.

\dagger At $I_b = 0.5$ A.

\ddagger Useful power output.

4CX1500BC



The 4CX1500BC is a low-voltage, high current tetrode specifically designed for exceptionally low intermodulation distortion and low grid current interception. The tube is recommended for radio-frequency linear amplification to 450 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	1,500 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	1 watt
Frequency for Max. Ratings (CW)	450 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	10.0 amperes
Capacitances (Gnd. Cath. Connection)	
Input	81.5 pF
Output	11.8 pF
Feed-through	0.02 pF
Transconductance	30,000 μ mhos
Base	Special Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	5.13 in; 130.3 mm
Maximum Diameter	3.37 in; 85.60 mm
Weight (approximate)	27 oz; 0.77 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	3,000	0.9	2900	225	0.71	—	1100†
AB ₁	AF Amplifier or Modulator	3,000	0.9	2900	325	1.7*	—	2774*

†Useful power output

*Two tubes

4CX3000A/8169



The 4CX3000A/8169 is designed to be used as a Class AB₁ linear amplifier in audio or radio-frequency applications. Its characteristics of low intermodulation distortion make it especially suitable for single sideband service.

This tube is unique in that a production test is included to insure minimum distortion products. The 4CX3000A/8169 must produce a minimum of 5300 watts in Class AB₁ service with 3rd order IM distortion at least 32 dB down, from one tone of two-tone signal.

The tube is also recommended for use as a Class C radio-frequency power amplifier and plate-modulated, radio-frequency power amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	3500 watts
Screen Dissipation (Max.)	175 watts
Grid Dissipation (Max.)	50 watts
Frequency for Max. Ratings (CW)	150 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	9.0 volts
Current	41.5 amperes
Capacitances (Gnd. Cath. Connection):	
Input	130.0 pF
Output	12.5 pF
Feed-through	1.0 pF
Capacitances (Gnd. Grid Connection):	
Input	61.0 pF
Output	12.5 pF
Feed-through	0.1 pF
Amplification Factor (g_{m2})	5.5
Base	Special, Breechblock
Recommended Air-System Socket	SK-1400
Recommended Air Chimney	SK-1406
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	7.90 in; 200.70 mm
Maximum Diameter:	4.63 in; 117.60 mm
Weight (approximate)	5.5 lb; 2.5 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	7000	2.0	7000	500	1.9	41	11,000
C	RF Amplifier Plate Modulated at 30 MHz	5000	1.4	5000	500	1.4	31	5750
AB	RF Linear Amplifier	7000	2.0	5000	850	1.7	—	5300†
AB	AF Amplifier or Modulator	6000	2.0	6000	850	3.1*	—	12,400*

*Two tubes.

†Useful output power.

4CX3500A



The 4CX3500A is a compact tetrode designed to be used in VHF power amplifier service. It features a type of internal structure which results in high RF operating efficiency up to 220 MHz.

This tube is also recommended for use as a VHF TV linear amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	3,500 Watts
Screen Dissipation (Max.)	165 Watts
Grid Dissipation (Max.)	50 Watts
Frequency for Max. Ratings (CW)	220 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	5.0 Volts
Current	90 amperes
Capacitances (Grounded Cathode Connection)	
Input	111.0 pF
Output	12.0 pF
Feed-through	0.5 pF
Capacitances (Grounded Grid Connection)	
Input	58.5 pF
Output	10.0 pF
Feed-through	0.4 pF
Amplification Factor (g_1g_2)	4.5
Base	Special Coaxial
Recommended Air System Socket	SK-340 Family
Recommended Air Chimney	SK-346
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	7.25 in; 184.15 mm
Maximum Diameter	4.94 in; 125.48 mm
Weight (approximate)	5.5 lb; 2.5 kg
Operating Position	Vertical base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Grid Driven RF Amplifier†	5,500	2.0	5,000	500	1.32	25	5280
C	Grid Driven RF Amplifier‡	5,500	2.0	4,300	750	1.90	66	5530

†30 MHz

‡100.5 MHz

4CX5000A/8170



The 4CX5000A/8170 is useful as an oscillator, amplifier, or modulator at frequencies up to 220 MHz, Class AB₁ audio amplifier, or as a screen-modulated radio-frequency amplifier.

The rated plate dissipation is 5 kW for most classes of services and 6 kW for Class AB operation.

CHARACTERISTICS

Plate Dissipation (Max.)	3500 Watts
Screen Dissipation (Max.)	165 Watts
Grid Dissipation (Max.)	50 Watts
Frequency for Max. Ratings (CW)	220 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	5.0 volts
Current	90 amperes
Capacitances (Grounded Cathode Connection)	
Input	111.0 pF
Output	12.0 pF
Feed-through	0.5 pF
Capacitances (Grounded Grid Connection)	
Input	58.5 pF
Output	10.0 pF
Feed-through	0.4 pF
Amplification Factor (g_1g_2)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-340 Family
Recommended Air Chimney	SK-346
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	7.25 in; 184.15 mm
Maximum Diameter	4.94 in; 125.48 mm
Weight (approximate)	5.5 lb; 2.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	7500†	3.0†	7500	500	2.8	150	16,000
C	RF Amplifier Plate Modulated	5500	2.5	5000	500	1.4	25	5,800
C	RF Amplifier Screen Modulated	7500	3.0	7500	350	1.1	11	3,550
AB ₁	RF Linear Amplifier	7500	4.0	7500	1250	1.9	—	10,000
AB ₁	AF Amplifier or Modulator	7500	4.0	7000	1250	3.7*	—	17,500*

*Two tubes.

†Derated values apply above 30 MHz to 220 MHz

4CX5000J/8909



The 4CX5000J/8909 incorporates rugged internal construction features, including a mesh filament.

The 4CX5000J/8909 is specifically designed for exceptionally low intermodulation distortion in radio-frequency linear amplifier service.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 Watts
Screen Dissipation (Max.)	250 Watts
Grid Dissipation (Max)	75 Watts
Frequency for Max. Ratings (CW)	100 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.5 volts
Current	103 amperes
Capacitances (Grounded Cathode Connection)	
Input	120.0 pF
Output	20.5 pF
Feed-through	0.7 pF
Capacitances (Grounded Grid Connection)	
Input	56.0 pF
Output	21.5 pF
Feed-through	0.10 pF
Amplification Factor (g_1g_2)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.13 in; 231.80 mm
Maximum Diameter	4.94 in; 125.40 mm
Weight (approximate)	9.5 lb; 4.31 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	7500	4.0	4050	800	1.7	—	3150*

*Useful power output; intermodulation distortion products \approx -40 dB.

4CX5000R/8170W



The 4CX5000R/8170W incorporates rugged internal construction features including a sturdy mesh filament, which allows it to meet demanding vibration and shock specifications.

The 4CX5000R/8170W is useful up to 110 MHz and is recommended for use as a radio-frequency linear amplifier, a Class AB audio amplifier, or a Class C power amplifier or plate-modulated amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	5000 Watts
Screen Dissipation (Max.)	250 Watts
Grid Dissipation (Max)	75 Watts
Frequency for Max. Ratings (CW)	100 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.5 volts
Current	75.0 amperes
Capacitances (Grounded Cathode Connection)	
Input	115.0 pF
Output	20.5 pF
Feed-through	0.7 pF
Capacitances (Grounded Grid Connection)	
Input	53.0 pF
Output	21.5 pF
Feed-through	0.1 pF
Amplification Factor (g_1g_2)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.13 in; 232 mm
Maximum Diameter	4.94 in; 125.00 mm
Weight (approximate)	9.5 lb; 4.31 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	7500	3.0	6500	750	2.3	100	10,000†
C	RF Amplifier Plate Modulated	5000	2.5	5000	500	1.4	25	5,800
AB ₁	RF Linear Amplifier	7500	4.0	7500	1250	1.9	—	10,000
AB ₁	AF Amplifier or Modulator	7500	4.0	7000	1250	3.7*	—	17,500*

*Two tubes.

†Useful Power Output.

4CX7500A



The 4CX7500A is a compact tetrode designed to be used in VHF power amplifier service. It features a type of internal structure which results in high RF operating efficiency up to 220 MHz. A dense mesh filament is used which contributes to the high performance capability of the tube.

This tube is also recommended for use as a VHF TV linear amplifier.

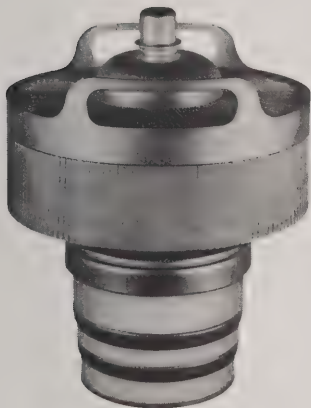
The CV2228 amplifier cavity is available for use with the 4CX7000A for 10 kW FM Broadcast Service.

CHARACTERISTICS

Plate Dissipation (Max.)	7500 Watts
Screen Dissipation (Max.)	150 Watts
Grid Dissipation (Max.)	50 Watts
Frequency for Max. Ratings (CW)	220 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.0 volts
Current	110 amperes
Capacitances (Grounded Cathode Connection)	
Input	145 pF
Output	20.0 pF
Feed-through	0.53 pF
Capacitances (Grounded Grid Connection)	
Input	74.1 pF
Output	20.6 pF
Feed-through	0.07 pF
Amplification Factor (g_1-g_2)	8
Base	Special, Coaxial
Recommended Air-System Socket	SK-340 (h _f); SK-350 (v _h f)
Recommended Air Chimney	SK-346
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.27 in; 235.46 mm
Maximum Diameter	5.66 in; 143.76 mm
Weight (approximate)	8.4 lb; 3.8 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	6,500	3.0	6,450	650	2.20	240	13,600
AB ₁	RF Linear Amplifier	8,000	2.5	7,500	1250	2.25	—	10,000

4CX10,000D/8171



The 4CX10,000D/8171 is identical electrically to the 4CX5000A/8170 except for its rated plate dissipation. Its increased dissipation capability, resulting from a larger cooler, is most useful in linear applications where plate dissipation is generally the limiting factor.

The larger cooler also allows the 4CX10,000D/8171 to be used in place of the 4CX5000A/8170 with cooler operation at any given air-flow rate.

CHARACTERISTICS

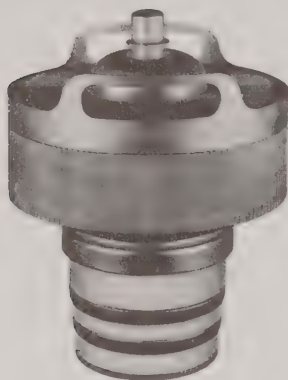
Plate Dissipation (Max.)	10,000 watts
Screen Dissipation (Max.)	250 watts
Grid Dissipation (Max.)	75 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	75.0 amperes
Capacitances (Gnd. Cath. Connection):	
Input	115.0 pF
Output	20.5 pF
Feed-through	0.7 pF
Capacitances (Gnd. Grid Connection):	
Input	53.0 pF
Output	20.5 pF
Feed-through	0.1 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-1306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	9.13 in; 232.00 mm
Maximum Diameter:	7.05 in; 179.00 mm
Weight (approximate)	12.0 lb; 5.50 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier	7500†	3.0†	7500	500	2.8	150	16,000
C	RF Power Amplifier Plate Modulated	5000	2.5	5000	500	1.4	25	5,800
AB ₁	RF Linear Amplifier	7500	4.0	7500	1500	3.3	—	15,950
AB ₁	AF Amplifier or Modulator	7500	4.0	7500	1500	6.7*	—	31,900*

*Two tubes.

†Derated values apply above 30 MHz.

4CX10,000J



The 4CX10,000J has a rated maximum plate dissipation of 12 kW. It incorporates rugged internal construction features, including a mesh filament.

The 4CX10,000J is specifically designed for exceptionally low intermodulation distortion in radio-frequency linear amplifier service.

CHARACTERISTICS

Plate Dissipation (Max.)	12,000 Watts
Screen Dissipation (Max.)	250 Watts
Grid Dissipation (Max.)	75 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.5 volts
Current	103 amperes
Capacitances (Grounded Cathode Connection)	
Input	120 pF
Output	20.5 pF
Feed-through	0.7 pF
Capacitances (Grounded Grid Connection)	
Input	56.0 pF
Output	21.5 pF
Feed-through	0.10 pF
Amplification Factor ($g_1 - g_2$)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-1306
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.13 in; 232.00 mm
Maximum Diameter	7.05 in; 179.00 mm
Weight (approximate)	12.2 lb; 5.50 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	7500	4.0	7500	1600	2.2	—	10,000*

*Useful output power.

4CX12,000A/8989



The 4CX12,000A is intended for use in audio or radio frequency applications. It features an internal mechanical structure which results in high RF operating efficiency. Low RF losses in this structure permit operation at full ratings up to 220 MHz.

The 4CX12,000A has a gain of 18 dB in FM broadcast service, and is also recommended for RF linear amplifier service, and for VHF-TV linear amplifier service. The anode is rated for 12 kilowatts of dissipation with forced-air cooling and incorporates a new highly efficient cooler design, which significantly reduces air pressure and flow requirements and produces low acoustic noise.

CHARACTERISTICS

Plate Dissipation (Max.)	12,000 Watts
Screen Dissipation (Max.)	300 Watts
Grid Dissipation (Max.)	150 Watts
Frequency for Max. Ratings (CW)	220 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	6.5 volts
Current	120 amperes
Capacitances (Grounded Cathode Connection)	
Input	160 pF
Output	18.5 pF
Feed-through	1.0 pF
Capacitances (Grounded Grid Connection)	
Input	70 pF
Output	18.6 pF
Feed-through	0.1 pF
Amplification Factor ($g_1 - g_2$)	6.7
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-336
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.84 in; 24.99 cm
Maximum Diameter	7.76 in; 19.71 cm
Weight (approximate)	19.2 lb; 8.75 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	3.5	9,000	750	2.83	23*	20,000†
C	RF Amplifier at 90.5 MHz‡	10,000	3.5	9,950	600	3.08	245	22,900‡
C	RF Amplifier at 108.1 MHz‡	10,000	3.5	10,000	800	2.81	275	22,500‡

*Approximate value

†Useful power, at the load.

‡Plate output power

§Measured values at frequency shown, in EIMAC cavity amplifier

4CX15,000A/8281, 4CX15,000R

The 4CX15,000A/8281 is intended for use in audio or radio frequency applications. It features a new type of internal mechanical structure which results in higher RF operating efficiency. Low RF losses in this mechanical structure permit operation of the 4CX15,000A/8281 at full ratings up to 110 MHz, and at reduced ratings, to 225 MHz.

The 4CX15,000R is identical to the 4CX15,000A except that it has a mesh filament. It is recommended for VHF TV linear amplifier service to 225 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 watts
Screen Dissipation (Max.)	450 watts
Grid Dissipation (Max.)	200 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection):	
Input	160.5 pF
Output	24.5 pF
Feed-through	1.5 pF
Capacitances (Gnd. Grid Connection):	
Input	67.0 pF
Output	25.5 pF
Feed-through	0.2 pF
Amplification Factor (g_{1-2})	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-316
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	9.38 in; 238.00 mm
Maximum Diameter:	7.58 in; 193.00 mm
Weight (approximate)	12.8 lb; 5.80 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	6.0	10,000	750	4.6	220	36,500
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.7	150	23,500
AB ₁	RF Linear Amplifier	10,000	6.0	10,000	1500	4.3	—	28,500
AB ₁	AF Amplifier or Modulator	10,000	6.0	10,000	1500	8.5*	—	57,700*
—	Television Linear Amplifier†	6,500	5.0	6,000	700	3.3	1350	16,500

Two tubes
† 4CX15,000R

4CX15,000J/8910

The 4CX15,000J/8910 is intended for use in audio or radio frequency applications. The internal structure features a mesh filament and a mechanical design which assures good strength and high RF operating efficiency.

Full ratings on the 4CX15,000J/8910 apply to 110 MHz, and it is especially recommended for radio frequency linear amplifier service.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 Watts
Screen Dissipation (Max.)	450 Watts
Grid Dissipation (Max.)	200 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.5 volts
Current	158 amperes
Capacitances (Grounded Cathode Connection)	
Input	160.5 pF
Output	26.5 pF
Feed-through	1.5 pF
Capacitances (Grounded Grid Connection)	
Input	67.0 pF
Output	27.5 pF
Feed-through	0.2 pF
Amplification Factor (g_{1-2})	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Recommended Air Chimney	SK-316
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.38 in; 238.00 mm
Maximum Diameter	7.58 in; 193.00 mm
Weight (approximate)	12.8 lb; 5.80 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	5.0	10,000	750	4.6	220	36,500
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.7	150	23,500
AB ₁	RF Linear Amplifier	10,000	6.0	7,500	1250	2.9	—	12,000†
AB ₁	AF Amplifier or Modulator	10,000	6.0	10,000	1500	8.5*	—	57,000*

*Two tubes.

†Useful output power, -39 dB 3rd and 5th order products.

4CX20,000A/8990



The 4CX20,000A/8990 is a power tetrode intended for use in audio or radio frequency applications. It features an internal mechanical structure which results in high RF operating efficiency. Low RF losses in this structure permit operation at full ratings up to 110 MHz and at reduced ratings to 220 MHz.

The 4CX20,000A/8990 has a gain of over 18 dB in FM broadcast service, and is also recommended for radio-frequency linear power amplifier service, and for VHF-TV linear amplifier service. The anode is rated for 20 kW of dissipation with forced-air cooling and incorporates a new highly efficient cooler design, which significantly reduces air pressure and flow requirements and produces low acoustical noise.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Screen Dissipation (Max.)	450 watts
Grid Dissipation (Max.)	200 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	10.0 volts
Current	140 amperes
Capacitances (Gnd. Cath. Connection):	
Input	190 pF
Output	23.5 pF
Feed-through	1.5 pF
Capacitances (Gnd. Grid Connection):	
Input	83 pF
Output	24.5 pF
Feed-through	0.2 pF
Amplification Factor (g_1g_2)	6.7
Base	Special, Coaxial
Recommended Air-System Socket	SK-320
Recommended Air Chimney	SK-326
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.5 in; 241.3 mm
Maximum Diameter	8.8 in; 223.5 mm
Weight (approximate)	19.2 lb; 8.75 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	5.0	9,000	900	4.0	26.4*	28,200†
C	RF Amplifier at 88.3 MHz‡	10,000	5.0	9,000	800	4.1	325	28,750**
C	RF Amplifier at 107.7 MHz‡	10,000	5.0	9,000	800	4.2	360	28,900**

*Approximate value.

†Plate output power.

**Useful power, at the load.

‡Measured values at frequency shown, in EIMAC CV-2200 cavity amplifier.

4CX20,000B



The 4CX20,000B is intended for use as a Class C RF power amplifier in AM broadcast service, for use as a push-pull audio amplifier or modulator, or as a pulse modulator.

The anode is rated for 20 kW dissipation and incorporates a highly efficient cooler of new design, which significantly reduces air pressure and flow requirements and produces low acoustical noise.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 Watts
Screen Dissipation (Max.)	450 Watts
Grid Dissipation (Max.)	200 Watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	10.0 volts
Current	140 amperes
Capacitances (Grounded Cathode Connection)	
Input	190 pF
Output	23.5 pF
Feed-through	1.5 pF
Capacitances (Grounded Grid Connection)	
Input	83 pF
Output	24.5 pF
Feed-through	0.2 pF
Amplification Factor (g_1g_2)	6.7
Base	Special, Coaxial
Recommended Air-System Socket	SK-320
Recommended Air Chimney	SK-326
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.84 in; 249.90 mm
Maximum Diameter	8.86 in; 225.04 mm
Weight (approximate)	20.0 lb; 9.06 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier	12,500	5.0	9,000	900	4.01	26	28,200
C	RF Power Amplifier Plate Modulated	10,000	5.0	7,800	750	4.60	35	29,000
AB ₁	AF Amplifier or Modulator	12,500	6.0	7,800	1,500	9.2*	—	44,000*
—	Pulse Modulator or Regulator	35,000	60‡	—	—	—	—	—

*Two tubes

‡Peak cathode current

4CX20,000C



The 4CX20,000C is recommended for use in audio or RF applications. It features an internal structure having low RF losses, permitting operation at full ratings to 110 MHz.

This tube has a gain of over 18 dB in FM broadcast service. It is also recommended for RF linear amplifier service. The anode is rated for 20 kW of dissipation and incorporates a highly efficient cooler of new design, which significantly reduces air pressure and flow requirements and produces a low acoustical noise.

The CV2202 30kW FM Broadcast Cavity is available for use with the 4CX20,000C. The CV2215 is available for 35kW FM Broadcast.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 Watts
Screen Dissipation (Max.)	450 Watts
Grid Dissipation (Max.)	200 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	10.0 volts
Current	140 amperes
Capacitances (Grounded Cathode Connection)	
Input	193 pF
Output	22.4 pF
Feed-through	0.6 pF
Capacitances (Grounded Grid Connection)	
Input	90 pF
Output	22.9 pF
Feed-through	0.08 pF
Amplification Factor (g_1-g_2)	6.7
Base	Special, Coaxial
Recommended Air-System Socket	SK-360
Recommended Air Chimney	SK-326
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.84 in; 249.90 mm
Maximum Diameter	8.86 in; 225.04 mm
Weight (approximate)	20.0 lb; 9.06 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier	12,500	5.0	9,000	900	4.01	26	28,200
C	RF Power Amplifier†	12,500	5.0	12,000	1,000	3.54	340	34,400
AB ₁	AF Amplifier or Modulator	12,500	6.0	7,800	1,500	9.20*	—	44,000*

†107.1 MHz

*Two tubes

4CX20,000D/9015



The EIMAC 4CX20,000D is a ceramic/metal VHF power tetrode intended for use as an RF amplifier up to 110 MHz. It is particularly recommended for use in the 88-108 MHz FM band. It features an electromechanical structure which provides high RF operating efficiency and low RF losses.

The 4CX20,000D has a gain of up to 20 dB in FM broadcast service. The anode is rated for 20 kilowatts of dissipation with forced-air cooling and incorporates a highly efficient cooler of new design, which significantly reduces air pressure and flow requirements and produces low acoustical noise.

CHARACTERISTICS

Plate Dissipation (Max.)	20,000 watts
Screen Dissipation (Max.)	300 watts
Grid Dissipation (Max.)	200 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.5 volts
Current	145 amperes
Capacitances (Gnd. Cath. Connection)	
Input	181 pF
Output	18.7 pF
Feed-through	0.5 pF
Capacitances (Gnd. Grid. Connection)	
Input	76 pF
Output	19.2 pF
Feed-through	0.05 pF
Amplification Factor (g_1-g_2)	9.5
Base	Special Coaxial
Recommended Air-System Socket	SK-360
Recommended Air Chimney	SK-336
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.51 in; 24.17 cm
Maximum Diameter	7.85 in; 19.95 cm
Weight (approximate)	14.8 lb; 6.7 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier†	12,500	5.0	11,600	1300	3.7	500	35,000

†108 MHz

4CX25,000A



The EIMAC 4CX25,000A is a ceramic/metal power tetrode intended for use in VHF-TV linear amplifier service. It features a type of internal mechanical structure which results in high RF operating efficiency. Low RF losses in this structure permit operation at full range to 230 MHz in TV linear amplifier service.

The anode is rated for 25 kW dissipation with forced-air cooling and uses a highly efficient cooler, which significantly reduces air pressure and flow requirements and produces low acoustical noise.

CHARACTERISTICS

Plate Dissipation (Max.)	25,000 watts
Screen Dissipation (Max.)	300 watts
Grid Dissipation (Max.)	180 watts
Frequency for Max. Ratings (CW)	230 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	8.5 volts
Current	150 amperes
Capacitances (Gnd. Cath. Connection)	
Input	170 pF
Output	18.6 pF
Feed-through	0.6 pF
Capacitances (Gnd. Grid Connection)	
Input	79 pF
Output	19 pF
Feed-through	0.07 pF
Amplification Factor (g_1 - g_2)	6.7
Base	Special Coaxial
Recommended Air-System Socket	SK-320
Recommended Air Chimney	SK-326
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.15 in; 23.2 cm
Maximum Diameter	8.86 in; 22.5 cm
Weight (approximate)	26.4 lb; 12 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Power Amplifier, Visual TV Service (cathode driven)	9000	8.0	7800	1080	5.35	1200‡	32,000‡

‡Peak-of-sync

4CX35,000C/8349



The 4CX35,000/8349 is intended for use at the 50 to 150 kW output power level. It is recommended for use as a Class C RF amplifier or oscillator a Class AB RF linear amplifier, or a Class AB push-pull AM amplifier or modulator.

CHARACTERISTICS

Plate Dissipation (Max.)	35,000 watts
Screen Dissipation (Max.)	1,750 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	295 amperes
Capacitances (Gnd. Cath. Connection):	
Input	440 pF
Output	55.0 pF
Feed-through	2.30 pF
Capacitances (Gnd. Grid Connection):	
Input	175 pF
Output	57 pF
Feed-through	0.4 pF
Amplification Factor (g_1 - g_2)	4.5
Base	Special, graduated rings
Recommended Air-System Socket	SK-1500A
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	17.34 in; 440.00 mm
Maximum Diameter:	9.75 in; 248.00 mm
Weight (approximate)	50 lb; 22.70 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	20,000	15.0	19,000	750	7.0	258	110,000
C	RF Amplifier Plate Modulated	14,000	15.0	12,000	750	5.4	125	55,000
AB ₁	RF Linear Amplifier	20,000	15.0	15,000	1500	5.7	—	55,000
AB ₁	AF Amplifier or Modulator	20,000	15.0	12,000	1500	9.2*	—	70,000*

*Two tubes.

4CX40,000G, 4CX40,000GM**CHARACTERISTICS**

Plate Dissipation (Max.)	40,000 Watts
Screen Dissipation (Max.)	1,500 Watts
Grid Dissipation (Max.)	1,000 Watts
Frequency for Max. Ratings (CW)	250 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.0 volts
Current	165 amperes
Capacitances (Grounded Cathode Connection)	
Input	447 pF
Output	36 pF
Feed-through	1.5 pF
Capacitances (Grounded Grid Connection)	
Input	155 pF
Output	37 pF
Feed-through	0.15 pF
Amplification Factor (g_1g_2)	8
Base	Special, graduated rings
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	11.70 in; 29.72 cm
Maximum Diameter	10.06 in; 25.55 cm
Weight (approximate)	55 lb; 25 kg
Operating Position	Vertical



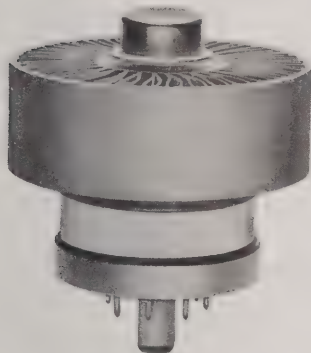
The 4CX40,000G power tetrode is intended for use in audio or radio frequency applications. It features a high stability pyrolytic graphite grid and a type of internal mechanical structure which results in high RF operating efficiency. Low RF losses in this structure permit operation at full ratings up to 220 MHz.

The 4CX40,000G is recommended for FM broadcast service and for VHF TV linear amplifier service. The anode is rated for 40 kW of dissipation with forced-air cooling and incorporates a highly efficient cooler of new design.

The 4CX40,000GM is recommended for use in linear amplifier service.

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	14,000	10.0	10,600	800	7.0	250	60,000
AB ₁	RF Linear Amplifier	14,000	15.0	10,000	1400	5.5	—	50,000*

*Peak envelope power

8930

The 8930 is electrically identical to the 4CX250R/7580W but the larger anode radiator assembly allows higher dissipation with low air flow and pressure drop characteristics.

The tube has rugged internal construction features for reliable operation under heavy shock or vibration conditions.

CHARACTERISTICS

Plate Dissipation (Max.)	350 watts
Screen Dissipation (Max.)	12 watts
Grid Dissipation (Max.)	2 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	2.6 amperes
Capacitances (Gnd. Cath. Connection):	
Input	17.5 pF
Output	4.9 pF
Feed-through	0.03 pF
Amplification Factor (g_1g_2)	5
Base	9-Pin Special
Recommended Air-System Socket	SK-600A
Recommended Air Chimney	SK-646
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	2.46 in; 62.60 mm
Maximum Diameter:	2.08 in; 52.80 mm
Weight (approximate)	5.5 oz; 156 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	2400	0.25	2000	350	0.29†	—	350†
AB ₁	RF Linear Amplifier AM Service	2000	0.25	2000	400	0.17‡	4	65‡
AB ₁	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	595*

*Two tubes.

†1-tone value; 2-tone $I_b \approx 0.20A$.

‡Carrier value; $I_b = 0.20A$ with 90% modulation.

Y-834



The Y-834 is a power tetrode especially designed for TV translator service and linear operation requiring low intermodulation distortion. It has a plate dissipation of 4.5 kW and is rated for service up to 1000 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	4,500 Watts
Screen Dissipation (Max.)	25 Watts
Grid Dissipation (Max.)	5 Watts
Frequency for Max. Ratings (CW)	1000 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	6.0 volts
Current	34.0 amperes
Capacitances (Grounded Cathode Connection)	
Input	40.0 pF
Output	8.2 pF
Feed-through	0.02 pF
Amplification Factor ($g_1 - g_2$)	7
Base	Special, Coaxial
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	5.31 in; 134.9 mm
Maximum Diameter	4.35 in; 116.8 mm
Weight (approximate)	4.6 lb; 1.75 kg
Operating Position	Vertical

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Gain (dB)	Output Power (watts)
A	Translator Service Aural and Video Signal	5,000	2.0	4,000	400	0.8†	15.5	1,100

†Black level plus audio

Y-863



The EIMAC Y-863 is a ceramic/metal VHF power tetrode intended for use as a retrofit for the 8F76R in VHF-TV amplifier service. A retrofit kit is available which allows use of the Y-863 in many NEC 10-15 kW visual TV cavities. The Y-863 features an electro-mechanical structure which provides high RF operating efficiency. Low losses in the structure permit operation at full ratings to 250 MHz in TV linear amplifier service.

Improved electron optics provide higher gain than the 8F76R, particularly in the high channels, easing exciter problems. Improved grid construction reduces tube-to-tube differences and contributes to extended life.

The anode is rated for 15 kilowatts dissipation with forced-air cooling.

CHARACTERISTICS

Plate Dissipation (Max.)	15,000 watts
Screen Dissipation (Max.)	250 watts
Grid Dissipation (Max.)	100 watts
Frequency for Max. Ratings (CW)	220 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	120 amperes
Capacitances (Gnd. Cath. Connection)	
Input	170 pF
Output	16 pF
Feed-through	0.5 pF
Capacitances (Gnd. Grid Connection)	
Input	72.5 pF
Output	17.5 pF
Feed-through	0.08 pF
Amplification Factor ($g_1 - g_2$)	8.5
Base	Special Coaxial
Recommended Retrofit Kit for installation in NEC PCN-1200 VHF-TV Visual Cavity	YC112
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.3 in; 23.6 cm
Maximum Diameter	7.4 in; 18.8 cm
Weight (approximate)	14 lb; 6.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)*	Drive Power (watts)*	Output Power (watts)†
AB	RF Amplifier at 177 MHz§	7500	3.5	5800	1010	2.1	415‡	10,000‡

* Approximate value.

† Useful power, at the load.

‡ Peak-of-sync.

§ Measured values at frequency shown, in NEC PCN-1200 cavity with EIMAC YC112 retrofit kit installed.

YC130/9019



The YC130/9019 is a ceramic/metal VHF power tetrode. It is rated for full power input to 110 MHz and is recommended for use as a Class C power amplifier or plate modulator amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	18,000 watts
Screen Dissipation (Max.)	450 watts
Grid Dissipation (Max.)	200 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.5 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection)	
Input	160 pF
Output	26.5 pF
Feed-through	1.5 pF
Capacitances (Gnd. Grid Connection)	
Input	67 pF
Output	27.5 pF
Feed-through	0.2 pF
Amplification Factor (g_1 - g_2)	4.5
Base	Special Coaxial
Recommended Air-System Socket	SK-360
Recommended Air Chimney	SK-316
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.4 in; 238 mm
Maximum Diameter	7.6 in; 192 mm
Weight (approximate)	12.8 lb; 5.8 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier†	10,000	5.0	10,000	750	4.55	220	36,500

†107.1 MHz

4CV50,000E



The 4CV50,000E is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier or a Class AB push-pull AF amplifier or modulator. The 4CV50,000E is also useful as a plate and screen modulated Class C RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	50,000 Watts
Screen Dissipation (Max.)	1,500 Watts
Grid Dissipation (Max)	400 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Vapor and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	12.0 volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	310.0 pF
Output	52.0 pF
Feed-through	0.7 pF
Amplification Factor (g_1 - g_2)	4.5
Base	Special
Recommended Air-System Socket	SK-2011A
Recommended Boiler	BR-710A
Maximum Seal & Envelope Temperature	250°C
Maximum Length (less Boiler)	11.50 in; 292.10 mm
Maximum Diameter (less Boiler)	9.53 in; 242.00 mm
Weight (approximate) (less Boiler)	31.5 lb; 14.3 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	17,500	12.0	15,000	1500	11.5	150	137,000
C	RF Amplifier Plate Modulated	15,000	12.0	14,000	750	9.25	685	110,000
AB ₁	RF Linear Amplifier	17,500	12.0	10,000	1800	9.14	—	57,000
AB ₁	AF Amplifier or Modulator	17,500	12.0	15,000	1250	18.6*	—	195,000*

*Two tubes.

4CV50,000J



The 4CV50,000J is a vapor-cooled power tetrode intended for use at the 50 to 100 kW output power level. This tube is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a class AB₁ RF linear amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	50,000 Watts
Screen Dissipation (Max.)	1,500 Watts
Grid Dissipation (Max.)	400 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Vapor and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	12.0 volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	320.0 pF
Output	48.0 pF
Feed-through	1.0 pF
Amplification Factor (g ₁ -g ₂)	4.5
Base	Special
Recommended Air-System Socket	SK-2011A
Recommended Boiler	BR-710A
Maximum Seal & Envelope Temperature	250°C
Maximum Length (less Boiler)	11.50 in; 292.10 mm
Maximum Diameter (less Boiler)	9.53 in; 242.00 mm
Weight (approximate) (less Boiler)	31.5 lb; 14.3 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	17,500	12.0	8300	1500	9.8	—	45,000

4CV100,000C/8351



The 4CV100,000C/8351 is recommended for use as a Class C RF amplifier or oscillator, a Class AB₁ RF linear amplifier or a Class AB₁ push-pull AF amplifier or modulator. The 4CV100,000C/8351 is also useful as a plate and screen modulated Class C RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	100,000 watts
Screen Dissipation (Max.)	1,750 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Vapor and Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	300 amperes
Capacitances (Gnd. Cath. Connection):	
Input	440 pF
Output	55.0 pF
Feed-through	2.3 pF
Capacitances (Gnd. Grid Connection):	
Input	175 pF
Output	57.0 pF
Feed-through	0.4 pF
Amplification Factor (g ₁ -g ₂)	4.5
Base	Special, Graduated Rings
Recommended Air-System Socket	SK-1500A
Maximum Seal & Envelope Temperature	250°C
Maximum Length: (less Boiler)	17.24 in; 437.90 mm
Maximum Diameter: (less Boiler)	10.07 in; 255.80 mm
Weight (approximate) (less Boiler)	68 lb; 30.9 kg.
Operating Position	Vertical, base up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	20,000	15.0	17,500	1500	11.8	125	168,000
C	RF Amplifier Plate Modulated	17,500	15.0	16,000	750	12.0	1260	138,500†
C	RF Amplifier Plate Modulated (Cathode Driven)	17,500	15.0	15,000	900	11.6	8100	141,000†
AB ₁	RF Linear Amplifier	20,000	15.0	18,000	1500	10.0	—	123,200
AB ₁	AF Amplifier or Modulator	20,000	15.0	18,000	1500	20.0*	—	246,400*

*Two tubes.

†Carrier conditions.

4CV100,000E

The 4CV100,000E is recommended for use as a Class C RF amplifier, a Class AB RF amplifier, a Class AB push-pull audio amplifier or modulator, as well as a high-level modulated or pulse-duration modulated amplifier. The tube is characterized by low input and feedback capacitances and low internal lead inductance. A rugged mesh thoriated-tungsten filament provides ample emission over long operating life.

CHARACTERISTICS

Plate Dissipation (Max.)	100,000 Watts
Screen Dissipation (Max.)	1,750 Watts
Grid Dissipation (Max.)	500 Watts
Frequency for Max. Ratings (CW)	108 MHz
Cooling	Vapor and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	470 pF
Output	61.0 pF
Feed-through	1.1 pF
Capacitances (Grounded Grid Connection)	
Input	200 pF
Output	61.0 pF
Feed-through	0.4 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special
Recommended Air System Socket	SK-2011A
Recommended Boiler	BR-710B
Maximum Seal & Anode Core Temperature	250°C
Maximum Length (less Boiler)	15.50 in; 39.37 cm
Maximum Diameter (less Boiler)	9.53 in; 24.21 cm
Weight (approximate) (less Boiler)	35.0 lb; 15.9 kg
Operating Position	Vertical, anode up

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	17,500	16.0	17,500	1,500	13.5	—	168,000
C	RF Amplifier	17,500	16.0	15,000	750	11.7	560	140,000
C	RF Amplifier Plate Modulated	15,000	16.0	15,000	750	11.7	530	140,000†
AB ₁	AF Amplifier or Modulator	17,500	16.0	15,000	1,500	19.5*	—	200,000*

†Carrier conditions

*Two tubes

4CV250,000B

The 4CV250,000B is recommended for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier or a Class AB push-pull AF amplifier or modulator. The 4CV250,000B is also useful as a plate and screen modulated Class C RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	250,000 watts
Screen Dissipation (Max.)	3,500 watts
Grid Dissipation (Max.)	1,500 watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Vapor and Water
Filament	Thoriated tungsten
Voltage	12.0 volts
Current	660 amperes
Capacitances (Gnd. Cath. Connection):	
Input	745 pF
Output	124 pF
Feed-through	6.0 pF
Capacitances (Gnd. Grid Connection):	
Input	324 pF
Output	128 pF
Feed-through	1.2 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special
Filament Connectors	SK-1710
Grid Connectors	SK-1712
Recommended Boiler	BR-620
Maximum Seal & Envelope Temperature	200°C
Maximum Length: (less Boiler)	28.02 in; 17.17 cm
Maximum Diameter: (less Boiler)	15.06 in; 38.26 cm
Weight (approximate): (less Boiler)	180 lb; 82 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	20,000	40.0	19,000	800	32.5	3000	460,000
C	RF Amplifier Plate Modulated	17,500	30.0	15,000	800	22.8	1630	280,000†
AB ₁	RF Linear Amplifier	20,000	40.0	20,000	1800	23.0	—	330,000
AB ₁	AF Amplifier or Modulator	20,000	40.0	20,000	1800	46.0*	—	660,000*

*Two tubes.

†Carrier conditions.

4CM2500KG/X2274

The EIMAC 4CM2500KG is a ceramic/metal, water-vapor cooled power tetrode designed for very-high-powered RF service.

The 4CM2500KG has a high-density thoriated-tungsten mesh filament mounted on water-cooled supports. Pyrolytic graphite control and screen grids are used to provide the necessary stability and power dissipation ratings. The maximum anode dissipation rating is 2500 kilowatts steady state.

Large-diameter coaxial terminals are used for the control grid and the RF cathode terminals. Filament power and filament support cooling water connections are made through two special connectors. Anode cooling water connections are made with available hand-tightened connectors.

CHARACTERISTICS

Plate Dissipation (Max.)	2,500,000 Watts
Screen Dissipation (Max.)	20,000 Watts
Grid Dissipation (Max)	8,000 Watts
Frequency for Max. Ratings (CW)	80 MHz
Maximum Useful Frequency	210 MHz
Cooling	Vapor and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 volts
Current	675 amperes
Capacitances (Grounded Cathode Connection)	
Input	1150 pF
Output	150 pF
Feed-through	5.0 pF
Amplification Factor (g_1g_2)	6
Base	Special Coaxial
Recommended Filament Power/Water	
Connectors (2 required)	SK-2310
Recommended Filament RF:	
Connector (1 required)	SK-2315
Recommended Anode Water:	
Connectors (2 required)	SK-2320 or SK-2321 or SK-2322
Maximum Seal & Anode Core Temperature	200°C
Maximum Length	18.75 in; 476.20 mm
Maximum Diameter	17.03 in; 432.60 mm
Weight (approximate)	153.0 lb; 69.5 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Screen Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
B or AB	RF Power Amplifier (grounded grid)	27,000	200	24,000	2,000	173	124,000	2,800

The 4CM2500KG is a member of Varian's EIMAC Megawatt family of "Super Power" Power Grid Tubes. In view of the value of these tubes, Varian engineers have chosen to equip each member of this family with an extra device which provides both a diagnostic and a system interlock; i.e. a device which assists the user in achieving optimum performance and in preventing serious tube damage. The addition of a mini (~0.1 1/s) Vac-Ion pump allows the user to determine the effect of a specific set of operating conditions on the tube's vacuum. A change in operating conditions accompanied by an increase in pressure indicates that the new operating conditions caused an increase in temperature of one or more of the tube's components; the degree and rate of pressure increase can be used to determine what action should be taken to avoid damage to the tube.

4CM300,000G/9000

The 4CM300,000G/9000 is a power tetrode with pyrolytic graphite control and screen grids for applications requiring tube outputs of 300 kW and above.

The tube is characterized by low input and feedback capacitances and low internal lead inductances. Its rugged mesh thoriated-tungsten filament provides ample emission for long operating life.

The multiphase-cooled anode is rated for 300 kW of dissipation. The pyrolytic grids have high dissipation ratings and low secondary emission characteristics.

CHARACTERISTICS

Plate Dissipation (Max.)	300,000 Watts
Screen Dissipation (Max.)	6,000 Watts
Grid Dissipation (Max)	2,000 Watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.0 volts
Current	500 amperes
Capacitances (Grounded Cathode Connection)	
Input	800 pF
Output	84.0 pF
Feed-through	6.0 pF
Amplification Factor (g_1g_2)	5
Base	Special Coaxial
Recommended Air System Socket	SK-2450
Maximum Seal & Anode Core Temperature	200°C
Maximum Length	22.50 in; 57.15 cm
Maximum Diameter	13.30 in; 33.80 cm
Weight (approximate)	121 lb; 55 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	Grid Driven RF Amplifier	20,000	50.0	11,000	1,000	35.2	1,440	301

4CM400,000A/AG

CHARACTERISTICS



The 4CM400,000A is a water-vapor cooled power tetrode designed for very-high power broadcast service to 110 MHz. The tube has a thoriated-tungsten mesh filament mounted on water-cooled supports. Maximum anode dissipation is 400 kilowatts steady state.

Large diameter coaxial terminals are used for the control grid and the RF filament terminals. Filament power and filament support cooling water connections are made through special couplings with threaded clamping rings.

The 4CM400,000AG uses a specially designed screen grid to provide improved efficiency in shortwave broadcast service.

- Plate Dissipation (Max.) 400,000 Watts
- Screen Dissipation (Max.) 7,500 Watts
- Grid Dissipation (Max) 2,000 Watts
- Frequency for Max. Ratings (CW) 110 MHz
- Maximum Useful Frequency 210 MHz
- Cooling Vapor and Water
- Filament Thoriated Tungsten Mesh
 - Voltage 16.3 volts
 - Current 600 amperes
- Capacitances (Grounded Cathode Connection)
 - Input 1,000 pF
 - Output 165 pF
 - Feed-through 5.0 pF
- Capacitances (Grounded Grid Connection)
 - Input 450 pF
 - Output 165 pF
 - Feed-through 0.7 pF
- Amplification Factor ($g_1 - g_2$) 4.5
- Base Special Coaxial
- Recommended Filament Power/Water:
 - Connectors (2 required) SK-2310
- Recommended Filament RF:
 - Connector (1 required) SK-2315
- Maximum Seal & Anode Core Temperature 200°C
- Maximum Length 18.25 in; 46.36 cm
- Maximum Diameter 17.03 in; 43.26 cm
- Weight (approximate) 170 lb; 77.3 kg
- Operating Position Vertical, base down

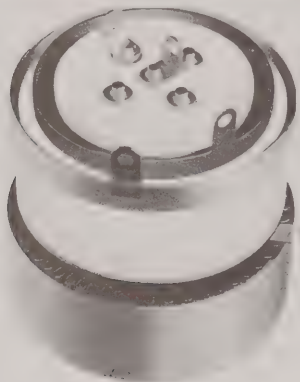
Class of Operation		Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
			Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Screen Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (kW)
C		RF Amplifier	22,500	65.0	21,000	1500	59	2700	1025†
C		RF Amplifier Plate Modulated‡	17,500	50.0	17,500	800	50	2400	700†
AB ₁		RF Linear Amplifier	22,500	65.0	20,000	1500	45	---	610†
AB ₁		AF Amplifier or Modulator	22,500	65.0	17,500	1500	78*	---	950*†

†Plate Power Output

‡Carrier Conditions

*Two Tubes

4CPL1000A, 4CPL1000B, 4CPL1000C

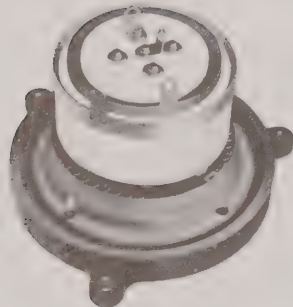


4CPL1000A

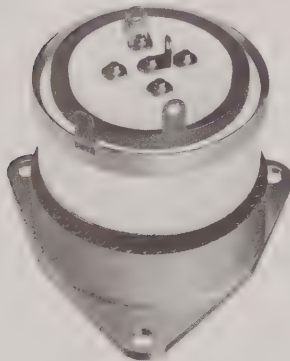
The 4CPL1000-series tubes are designed for switch tube, pulse modulator, or voltage regulator service. They will pass anode current up to 8 amperes for pulses up to 100 microseconds duration, and derated values of anode current at longer pulse durations.

All three tubes are designed for immersion cooling in a liquid dielectric and can dissipate 1,000 watts. In air, with proper cooling, plate dissipation is 300 watts. The 4CPL1000A mounting is optional; the 4CPL1000B has a special support for environmental stress absorption. The 4CPL1000C has an integral mounting flange.

The tubes are rated to operate at an anode potential up to 15 kVdc when immersed in the recommended coolant. When immersed, the rating is not altitude-dependent.



4CPL1000B



4CPL1000C

CHARACTERISTICS

Plate Dissipation (Max.)	1,000 watts
Screen Dissipation (Max.)	15 watts
Grid Dissipation (Max.)	2 watts
Cooling	Liquid or Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.3 volts
Current	4.9 amperes
Capacitances:	
g ₁ -k	26 pF
g ₁ -g ₂	33 pF
g ₂ -p	5.3 pF
g ₁ -p	0.1 pF
p-k	0.1 pF
g ₂ -k	27 pF
Base	Special with solder terminals
Maximum Seal & Anode Core Temperature	250°C
Maximum Overall Dimensions:	
4CPL1000A Length	2.71 in; 68.83 mm
Diameter	2.05 in; 51.94 mm
4CPL1000B Length	2.71 in; 68.83 mm
Diameter	3.00 in; 76.20 mm
4CPL1000C Length	2.68 in; 68.07 mm
Diameter	2.75 in; 69.85 mm
Operating Position	Any

Type of Service	MAXIMUM RATINGS					
	Peak Positive Plate Voltage (volts)	Plate Voltage (volts)	Plate Voltage (volts)	Peak Plate Current (amps)	Screen Voltage (volts)	Grid Voltage (volts)
Pulse Modulator or Switch Tube	20,000†	15,000†	7,000‡	8.0*	700	-150

†In liquid dielectric coolant.
‡In air with recommended minimum cooling.
*Pulse duration, peak current and duty are inter-related.

4CW800B, 4CW800F

The 4CW800B and 4CW800F are designed for use in distributed amplifiers and VHF/UHF power amplifiers.

The mechanical and electrical features of these tubes are compatible with distributed amplifier circuit requirements; i.e., low lead inductance, low input and output capacitance and small size.

Ruggedized construction consisting of a unitized electrode structure and direct mounting to the chassis, combine to make the 4CW800B and 4CW800F suitable for environments of severe shock and vibration.

Anode water fittings not supplied.

CHARACTERISTICS

Plate Dissipation (Max.)	800 watts
Screen Dissipation (Max.)	15 watts
Grid Dissipation (Max.)	3 watts
Frequency for Max. Ratings (CW)	500 MHz
Cooling	Water
Cathode	Oxide-coated Unipotential
Voltage (4CW800B)	6.0 volts
(4CW800F)	26.5 volts
Current (4CW800B)	4.4 amperes
(4CW800F)	1.1 amperes
Capacitances (Gnd. Cath. Connection):	
Input	45.0 pF
Output	5.8 pF
Feed-through	0.15 pF
Input Conductance ($I_b = 600$ mAdc)	0.1×10^{-3} mhos
Transconductance††	40,000 μ mhos
Base	Special
Recommended screen bypass capacitor	SK-680
Maximum Seal & Envelope Temperature	250°C
Maximum Length:	3.00 in; 76.20 mm
Maximum Diameter:	2.03 in; 51.60 mm
Weight (approximate)	7 oz; 198.0 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	RF Linear Amplifier at 140–250 MHz	3000	0.6	2500	300	0.60	—	820*
B	RF Linear Amplifier at 432 MHz	3000	0.6	2000	300	0.60	†	770*
B	RF Linear Amplifier at 865 MHz	3000	0.6	2000	300	0.60	‡	550*
AB	RF Linear Amplifier, Broadband Service	3000	0.6	2500	275	0.58	—	1000

*Useful Output power.

†Power Gain approx. 15.3 dB at 432 MHz.

‡Power Gain approx. 9 dB at 865 MHz.

†₁At $I_b = 0.6$ A

4CPW10,000R/9016

The 4CPW10,000/9016 is intended for use as a pulse modulator or regulator for use with magnetrons, crossed-field amplifiers, TWTs, klystrons, and other RF power sources. The inherent constant current characteristic of this tetrode is well suited for series switching of plasma-discharge devices, electron-beam welding equipment, etc. The rugged construction of this tube allows it to be used under demanding vibration and shock conditions.

The holdoff voltage rating is 25 kVdc in pulse modulator or regulator service, with a peak anode current rating of 24 amperes.

CHARACTERISTICS

Plate Dissipation (Max.)	10,000 watts
Screen Dissipation (Max.)	250 watts
Grid Dissipation (Max.)	75 watts
Cooling	Water and Forced Air
Filament	Thoriated Tungsten mesh
Voltage	7.5 volts
Current	75 amperes
Capacitances (Gnd. Cath. Connection)	
Input	115 pF
Output	20.0 pF
Feed-through	0.7 pF
Amplification Factor (g_{1-2})	4.5
Base	Coaxial
Recommended Air System Socket	SK-300A
Recommended Liquid-Cooled Socket	Y-632D
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	11.44 in; 29.06 cm
Maximum Diameter	4.66 in; 11.84 cm
Weight (approximate)	7.5 lb; 3.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Output Power (kW)
—	Switch Tube or Pulse Modulator	25,000	24.0†	20,000	1,250	20.0†	370

†Pulse Value

4CW10,000A/8661

The 4CW10,000A is electrically identical to the 4CX10,000D/8171 and 4CX5000A/8170 except for plate dissipation, which is rated at 12 kW. The tube is useful up to 110 MHz and is suggested for general use as an oscillator, amplifier or modulator. A pair of these tubes will deliver more than 30 kW of audio output.

CHARACTERISTICS

Plate Dissipation (Max.)	12,000 watts
Screen Dissipation (Max.)	250 watts
Grid Dissipation (Max.)	75 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	75 amperes
Capacitances (Gnd. Cath. Connection)	
Input	115 pF
Output	20.5 pF
Feed-through	1.0 pF
Capacitances (Gnd. Grid Connection)	
Input	53 pF
Output	20.5 pF
Feed-through	0.16 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special Coaxial
Recommended Air System Socket	SK-300 Family
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	11.44 in; 29.06 cm
Maximum Diameter	4.66 in; 11.84 cm
Weight (approximate)	7.5 lb; 3.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier to 30 MHz	7,500	3.0	7,500	500	2.8	150	16,000
C	RF Amplifier to 110 MHz	6,500	2.6	—	—	—	—	—
C	RF Amplifier Plate Modulated	5,000	2.5	5,000	500	2.4	120	8,500
AB ₁	RF Linear Amplifier	7,500	4.0	7,500	1,500	3.33	—	15,950
AB ₂	AF Amplifier or Modulator	7,500	4.0	7,500	1,500	6.66*	—	31,900*

*Two tubes

4CW10,000B

The 4CW10,000B is recommended for use as a linear amplifier for HF and VHF service. It incorporates a special anode cooling jacket and a thoriated-tungsten mesh filament to achieve very low noise modulation of the electron stream.

The tube is rated for full input up to 110 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	12,000 Watts
Screen Dissipation (Max.)	250 Watts
Grid Dissipation (Max.)	75 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	7.5 volts
Current	75 amperes
Capacitances (Grounded Cathode Connection)	
Input	120 pF
Output	20.5 pF
Feed-through	0.7 pF
Capacitances (Grounded Grid Connection)	
Input	56 pF
Output	21.5 pF
Feed-through	0.1 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special Coaxial
Recommended Air System Socket	SK-300 Family
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	9.0 in; 23.0 cm
Maximum Diameter	4.33 in; 11.0 cm
Weight (approximate)	8.6 lb; 3.9 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB ₁	RF Linear Amplifier	7,500	4.0	7,500	1,600	2.2	—	10,000†

†Useful output power

4CW25,000A



The 4CW25,000A is a tetrode intended for use in audio or radio frequency applications. It is recommended for RF linear power amplifier service for television linear amplifier service, and as a switch tube for pulsed regulator service.

CHARACTERISTICS

Plate Dissipation (Max.)	25,000 watts
Screen Dissipation (Max.)	450 watts
Grid Dissipation (Max.)	200 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	6.3 volts
Current	160 amperes
Capacitances (Gnd. Cath. Connection):	
Input	160 pF
Output	24.5 pF
Feed-through	1.5 pF
Capacitances (Gnd. Grid Connection):	
Input	67 pF
Output	25.5 pF
Feed-through	0.2 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special, Coaxial
Recommended Air-System Socket	SK-300A
Maximum Seal & Envelope Temperature	250°C
Maximum Length:	12.69 in; 322.00 mm
Maximum Diameter:	4.75 in; 121.00 mm
Weight (approximate)	13.5 lb; 6.1 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	5.0	10,000	750	4.5	220	36,500
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.6	150	23,500
AB ₁	RF Linear Amplifier	10,000	6.0	10,000	1500	4.2	—	28,500
AB ₁	AF Amplifier or Modulator	10,000	6.0	10,000	1500	8.5*	—	57,000*

*Two tubes.

4CW25,000B



The 4CW25,000B is intended for use in audio or radio frequency applications and features an internal structure which results in high RF operating efficiency. It incorporates a thoriated-tungsten mesh filament and a special anode cooling jacket to achieve very low noise modulation of the electron stream.

The tube is rated at full power to 110 MHz and at reduced ratings to 225 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	25,000 Watts
Screen Dissipation (Max.)	450 Watts
Grid Dissipation (Max.)	200 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	6.3 volts
Current	160 amperes
Capacitances (Grounded Cathode Connection)	
Input	160 pF
Output	24.5 pF
Feed-through	1.5 pF
Capacitances (Grounded Grid Connection)	
Input	67 pF
Output	25.5 pF
Feed-through	0.2 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special Coaxial
Recommended Air System Socket	SK-300 Family
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	12.7 in; 32.2 cm
Maximum Diameter	4.6 in; 11.8 cm
Weight (approximate)	13.5 lb; 6.1 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	5.0	10,000	750	4.55	220	36,500
C	RF Amplifier Plate Modulated	8,000	4.0	8,000	750	3.65	150	23,500
AB ₁	RF Linear Amplifier	10,000	6.0	10,000	1,500	4.25	—	28,500
AB ₁	AF Amplifier or Modulator	10,000	6.0	10,000	1,500	8.5*	—	57,000*
AB ₁	Grid Driven TV Service†	6,500	5.0	6,000	700	3.33	1,350	16,500

*Two tubes

†Peak Sync Level at 225 MHz

4CW30,000A



The 4CW30,000A is a tetrode intended for use in a variety of applications. It is recommended for RF linear power amplifier service, for television linear amplifier service, for industrial RF amplifier service, and as a switch tube for pulsed regulator applications.

CHARACTERISTICS

Plate Dissipation (Max.)	30,000 watts
Screen Dissipation (Max.)	450 watts
Grid Dissipation (Max.)	200 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	10.0 volts
Current	140 amperes
Capacitances (Gnd. Cath. Connection)	
Input	190 pF
Output	23.5 pF
Feed-through	1.5 pF
Capacitances (Gnd. Grid Connection)	
Input	83 pF
Output	24.5 pF
Feed-through	0.2 pF
Amplification Factor (g_1 - g_2)	6.7
Base	Special Coaxial
Recommended Air-System Socket	SK-300A
Maximum Seal and Envelope Temperature	250°C
Maximum Length	12.69 in; 322.00 mm
Maximum Diameter	4.75 in; 121.00 mm
Weight (approximate)	13.5 lb; 6.1 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	10,000	5.0	9,000	800	4.2	360	28,900
AB ₁	RF Linear Amplifier	10,000	6.0	7,800	1500	4.6	—	22,000
—	Pulse Modulator or Regulator	25,000	60‡	—	—	—	—	—

‡Peak Cathode Current

4CW50,000E



The 4CW50,000E is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier or a Class AB push-pull AF amplifier or modulator. The 4CW50,000E is also useful as a plate and screen modulated Class C RF amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	50,000 Watts
Screen Dissipation (Max.)	1,500 Watts
Grid Dissipation (Max)	400 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	12.0 volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	310 pF
Output	52.0 pF
Feed-through	0.7 pF
Capacitances (Grounded Grid Connection)	
Input	140 pF
Output	52.0 pF
Feed-through	0.3 pF
Amplification Factor (g_1 - g_2)	4.5
Base	Special Coaxial
Recommended Air System Socket	SK-2011 A
Recommended Water Jacket	SK-2050
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	11.50 in; 292.00 mm
Maximum Diameter	9.53 in; 242 mm
Weight (approximate)	35.0 lb; 15.9 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	17,500	12.0	15,000	1500	11.5	150	137,000
C	RF Amplifier Plate Modulated	15,000	12.0	14,000	750	9.2	685	110,000
AB ₁	RF Linear Amplifier	17,500	12.0	10,000	1800	9.1	—	57,000
AB	AF Amplifier or Modulator	17,500	12.0	15,000	1250	18.6*	—	195,000*

*Two tubes.

4CW50,000J

The 4CW50,000J is characterized by low input and feedback capacitances and low internal lead inductances. A rugged mesh thoriated tungsten filament provides adequate emission over the long operating life. It is recommended for use as a Class AB₁ RF linear amplifier.

CHARACTERISTICS

Plate Dissipation (Max.)	50,000 Watts
Screen Dissipation (Max.)	1,500 Watts
Grid Dissipation (Max.)	300 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	12.0 Volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	310 pF
Output	48.0 pF
Feed-through	1.0 pF
Capacitances (Grounded Grid Connection)	
Input	123 pF
Output	50.0 pF
Feed-through	0.3 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special Coaxial
Recommended Air System Socket	SK-2011A
Recommended Water Jacket	SK-2050
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	11.50 in; 292.00 mm
Maximum Diameter	9.53 in; 242.00 mm
Weight (approximate)	35 lb; 15.9 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB	RF Linear Amplifier	17,500	12.0	8300	1500	9.8	—	45,000

4CW100,000D

The 4CW100,000D is recommended for use as a Class C RF amplifier or oscillator, a Class AB₁ RF linear amplifier or a Class AB₁ push-pull AF amplifier or modulator. The 4CW100,000D is also useful as a plate and screen modulated Class C RF amplifier, and in pulse modulator-regulator service.

CHARACTERISTICS

Plate Dissipation (Max.)	100,000 watts
Screen Dissipation (Max.)	1,750 watts
Grid Dissipation (Max.)	500 watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	10.0 volts
Current	295 amperes
Capacitances (Gnd. Cath. Connection):	
Input	440 pF
Output	55.0 pF
Feed-through	2.3 pF
Capacitances (Gnd. Grid Connection):	
Input	175 pF
Output	57.0 pF
Feed-through	0.4 pF
Amplification Factor (g_1-g_2)	4.5
Base	Special Graduated Rings
Recommended Air-System Socket	SK-1500A
Recommended Water Jacket	Integral
Maximum Seal & Envelope Temperature	250°C
Maximum Length:	18.00 in; 457.00 mm
Maximum Diameter:	8.00 in; 203.00 mm
Weight (approximate)	60.0 lb; 27.2 kg.
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	15.0	19,000	750	10.0	1165	165
C	RF Amplifier Plate Modulated	17,500	15.0	16,000	750	10.0	870	138
AB ₁	RF Linear Amplifier	20,000	15.0	18,000	1500	10.0	—	123
AB ₁	AF Amplifier or Modulator	20,000	15.0	18,000	1500	20.0*	—	246*
—	Switch Tube or Pulse Modulator	40,000	200†	38,000	1500	112‡	16,800‡	3600‡

*Two tubes.

†Pulse cathode current.

‡Pulse value.

4CW100,000E



The 4CW100,000E is ideal for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier, or a Class AB push-pull AF amplifier or modulator as well as a plate- and screen-modulated Class C RF amplifier. In pulse-modulator service, it can deliver a peak output of 4 megawatts. The tube is characterized by low input and feedback capacitances and low internal lead inductances.

CHARACTERISTICS

Plate Dissipation (Max.)	100,000 Watts
Screen Dissipation (Max.)	1,750 Watts
Grid Dissipation (Max)	500 Watts
Frequency for Max. Ratings (CW)	108 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 Volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	370 pF
Output	60.0 pF
Feed-through	1.0 pF
Capacitances (Grounded Grid Connection)	
Input	175 pF
Output	60.0 pF
Feed-through	0.35 pF
Base	Special Coaxial
Recommended Air System Socket	SK-2011A
Recommended Water Jacket	SK-2100
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	12.82 in; 325.60 mm
Maximum Diameter	9.53 in; 242.10 mm
Weight (approximate)	38.5 lb; 17.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	16.0	20,000	1500	15.2	120	220
C	RF Amplifier Plate Modulated	17,500	16.0	15,000	750	11.7	530	140
AB ₁	RF Linear Amplifier	20,000	16.0	18,000	1500	13.5	—	168
AB ₁	AF Amplifier or Modulator	20,000	16.0	15,000	1500	19.5*	—	200*

*Two tubes.

4CW150,000E



The 4CW150,000E is intended for use as a Class C RF amplifier or oscillator, a Class AB push-pull AF amplifier or modulator as well as a plate- and screen-modulated Class C RF amplifier. In pulse modulator service, it can deliver a peak output of 4 megawatts. The tube is characterized by low input and feedback capacitances and low internal lead inductance.

CHARACTERISTICS

Plate Dissipation (Max.)	150,000 Watts
Screen Dissipation (Max.)	1,750 Watts
Grid Dissipation (Max)	500 Watts
Frequency for Max. Ratings (CW)	110 MHz
Maximum Useful Frequency	250 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	370 pF
Output	60.0 pF
Feed-through	1.0 pF
Capacitances (Grounded Grid Connection)	
Input	175 pF
Output	60.0 pF
Feed-through	0.35 pF
Base	Special Coaxial
Recommended Air-System Socket	SK-2011A
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	14.3 in; 36.2 cm
Maximum Diameter	9.5 in; 24.2 cm
Weight (approximate)	47 lb; 21.4 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	22,000	20.0	20,000	1,500	15.2	120	220
C	RF Amplifier Plate Modulated	17,500	20.0	15,000	750	11.7	530	140
AB ₁	RF Linear Amplifier	22,000	20.0	18,000	1,500	13.5	—	168
—	Pulse Modulator	40,000	200†	40,000	2,500	122‡	—	4,100‡

†Cathode current, pulse

‡Pulse value

4CW250,000B

The 4CW250,000B is recommended as a Class C amplifier or oscillator; a Class AB RF linear amplifier; a Class AB push-pull AF linear amplifier or modulator; a plate or screen modulated Class C RF amplifier; or for pulse modulator or regulator service. Water jacket not included.

CHARACTERISTICS

Plate Dissipation (Max.)	250,000 watts
Screen Dissipation (Max.)	3,500 watts
Grid Dissipation (Max.)	1,500 watts
Frequency for Max. Ratings (CW)	50 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	12.0 volts
Current	660 amperes
Capacitances (Gnd. Cath. Connection):	
Input	745 pF
Output	124 pF
Feed-through	6.0 pF
Capacitances (Gnd. Grid Connection):	
Input	324 pF
Output	128 pF
Feed-through	1.2 pF
Amplification Factor ($g_1 - g_2$)	4.5
Base	Special
Recommended Filament Connector	SK-1710
Recommended Grid Connector	SK-1712
Recommended Anode Water Jacket	SK-1720
Maximum Seal & Envelope Temperature	200°C
Maximum Length:	27.65 in; 70.23 cm
Maximum Diameter:	13.06 in; 33.17 cm
Weight (approximate) (tube only)	98.0 lb; 44.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	40.0	19,000	800	32.5	3000	460
C	RF Amplifier Plate Modulated	17,500	30.0	14,000	800	29.0	2320	285
AB ₁	RF Linear Amplifier	20,000	40.0	20,000	1800	23.0	—	330
AB ₁	AF Amplifier or Modulator	20,000	40.0	20,000	1800	46.0*	—	660*

*Two tubes.

8959

The 8959 is designed for use as a Class C RF amplifier or oscillator, a Class AB RF linear amplifier, or a Class AB push-pull audio amplifier or modulator, as well as a plate and screen modulated Class C RF amplifier.

In pulse modulator service it can deliver a peak output of 4 megawatts.

The tube is characterized by low input and feedback capacitances and low internal lead inductances. Its rugged mesh thoriated tungsten filament provides ample emission for long operating life.

CHARACTERISTICS

Plate Dissipation (Max.)	100,000 Watts
Screen Dissipation (Max.)	1,750 Watts
Grid Dissipation (Max.)	500 Watts
Frequency for Max. Ratings (CW)	108 MHz
Maximum Useful Frequency	250 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	370 pF
Output	60.0 pF
Feed-through	1.0 pF
Capacitances (Grounded Grid Connection)	
Input	175 pF
Output	60.0 pF
Feed-through	0.35 pF
Base	Special Coaxial
Recommended Air-System Socket	SK-2011A
Maximum Seal & Envelope Temperature	250°C
Maximum Length	12.57 in; 319.30 mm
Maximum Diameter	8.26 in; 209.80 mm
Weight (approximate)	38.5 lb; 17.5 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	20,000	16.0	20,000	1500	15.2	120	220
C	RF Amplifier Plate Modulated	17,500	16.0	15,000	750	11.7	530	140
AB ₁	RF Linear Amplifier	20,000	16.0	18,000	1500	13.5	—	168
AB ₁	AF Amplifier or Modulator	20,000	16.0	15,000	1500	19.5*	—	200*
—	Switch Tube or Pulse Modulator	40,000	200†	40,000	2500	110	—	4100

*Two tubes.

†Cathode current, pulse.

8973



The 8973 is a power tetrode designed for very-high-powered medium-frequency or high-frequency broadcast service and very-low-frequency communication in the half-megawatt power range.

The 8973 has a thoriated-tungsten filament mounted on water-cooled supports.

The maximum anode dissipation rating is 1400 kW steady state.

Large-diameter coaxial terminals are used for the control grid and the RF filament terminals. Filament power and filament support cooling-water connections are made through special couplings with threaded clamping rings.

CHARACTERISTICS

Plate Dissipation (Max.)	1,000,000 Watts
Screen Dissipation (Max.)	7,500 Watts
Grid Dissipation (Max.)	2,000 Watts
Frequency for Max. Ratings (CW)	110 MHz
Maximum Useful Frequency	210 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	16.3 volts
Current	600 amperes
Capacitances (Grounded Cathode Connection)	
Input	1000 pF
Output	165 pF
Feed-through	5.0 pF
Amplification Factor ($g_1 - g_2$)	4.5
Base	Special Coaxial
Recommended Filament Power/Water:	
Connectors (2 required)	SK-2310
Recommended Filament RF:	
Connector (1 required)	SK-2315
Recommended Anode Water:	
Connectors (2 required)	SK-2320 or SK-2321 or SK-2322
Maximum Seal & Envelope Temperature	200°C
Maximum Length	18.75 in; 476.20 mm
Maximum Diameter	17.03 in; 432.60 mm
Weight (approximate)	153.0 lb; 69.5 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Screen Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (kW)
C	RF Amplifier	22,500	65.0	21,000	1500	59.0	2700	1025
C	RF Amplifier Plate Modulated†	17,500	50.0	17,500	800	50.0	2400	700†
AB ₁	RF Linear Amplifier	22,500	110.0	20,000	1500	45.0	---	610†
AB ₁	AF Amplifier or Modulator	22,500	110.0	17,500	1500	78.0*	---	950*†
B	RF Amplifier, Long Pulse, Grounded Grid	30,000	110.0	24,500	1750	94.2	71,400	1770†

†Plate Power Output

‡Carrier Conditions

*†Two Tubes

The 8973 is a member of Varian's EIMAC Megawatt family of "Super Power" Power Grid Tubes. In view of the value of these tubes, Varian engineers have chosen to equip each member of this family with an extra device which provides both a diagnostic and a system interlock: ie, a device which assists the user in achieving optimum performance and in preventing serious tube damage. The addition of a mini (~0.1 l/s) Vac-Ion pump allows the user to determine the effect of a specific set of operating conditions on the tube's vacuum. A change in operating conditions accompanied by an increase in pressure indicates that the new operating conditions caused an increase in temperature of one or more of the tube's components; the degree and rate of pressure increase can be used to determine what action should be taken to avoid damage to the tube.



The 8974 is a power tetrode designed for very-high-powered medium-frequency or high-frequency broadcast service and very-low-frequency communication in the megawatt power range.

The 8974 has a two-section thoriated tungsten filament mounted on water-cooled supports. The two sections may be fed in quadrature to reduce hum contributed by an ac power source. The maximum anode dissipation rating is 1500 kW steady state.

Large-diameter coaxial terminals are used for the control grid and the RF filament terminals. Filament power and filament support cooling-water connections are made through three special couplings with threaded clamping rings.

CHARACTERISTICS

Plate Dissipation (Max.)	1,500,000 Watts
Screen Dissipation (Max.)	15,000 Watts
Grid Dissipation (Max.)	4,000 Watts
Frequency for Max. Ratings (CW)	30 MHz
Maximum Useful Frequency	100 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh, two section
Voltage	16.3 volts
Current	600 amperes
Capacitances (Grounded Cathode Connection)	
Input	1600 pF
Output	250 pF
Feed-through	6 pF
Capacitances (Grounded Grid Connection):	
Input	675 pF
Output	260 pF
Feed-through	1.0 pF
Amplification Factor ($g_1 + g_2$)	4.5
Base Terminals	Special Coaxial
Recommended Filament Power/Water:	
Connectors (2 required)	SK-2310
Recommended Filament RF:	
Connector (1 required)	SK-2315
Recommended Anode Water:	
Connectors (2 required)	SK-2320 or SK-2321 or SK-2322
Maximum Seal & Envelope Temperature	200°C
Maximum Length	23.75 in; 60.30 cm
Maximum Diameter	17.03 in; 43.30 cm
Weight (approximate)	175.0 lb; 80.0 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
C	RF Amplifier	22,500	125	21,500	1000	125	7000	2158†
C	RF Amplifier Plate Modulated‡	17,500	100	17,500	1000	95.0	6465	1384†
AB ₁	RF Linear Amplifier	22,500	125	20,000	1500	86.5	—	1225†
AB ₁	AF Amplifier or Modulator	22,500	125	17,500	1500	146*	—	2015*†

*Two tubes.

†Plate power output.

‡Carrier conditions.

The 8974 is a member of Varian's EIMAC Megawatt family of "Super Power" Power Grid Tubes. In view of the value of these tubes, Varian engineers have chosen to equip each member of this family with an extra device which provides both a diagnostic and a system interlock: i.e., a device which assists the user in achieving optimum performance and in preventing serious tube damage. The addition of a mini (-0.1 l/s) Vac-Ion pump allows the user to determine the effect of a specific set of operating conditions on the tube's vacuum. A change in operating conditions accompanied by an increase in pressure indicates that the new operating conditions caused an increase in temperature of one or more of the tube's components; the degree and rate of pressure increase can be used to determine what action should be taken to avoid damage to the tube.

9008/4CPW300,000A



The 9008 is a water-cooled power tetrode intended for use as a pulse modulator or in pulse regulator service.

The tube is rated for 100 kVdc hold-off in a protective atmosphere, with a 90 amperes pulse cathode current rating during conduction and a 300 kW anode dissipation rating (average during the pulse).

Peak anode current capability in excess of 150 amperes for short pulse operation is practical.

CHARACTERISTICS

Plate Dissipation (Max.)	300,000 watts
Screen Dissipation (Max.)	3,500 watts
Grid Dissipation (Max.)	1,500 watts
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	12.0 volts
Current	660 amperes
Capacitances (Gnd. Cath. Connection):	
Input	770 pF
Output	122 pF
Feed-through	4.0 pF
Amplification Factor ($g_1 - g_2$)	4.5
Recommended SF-6 Containment Hood	SK-2316
Base	Special
Recommended Connectors:	
Filament (2 required)	SK-1710
Control Grid (1 required)	SK-1712
Maximum Seal & Envelope Temperature	200°C
Maximum Length	28.8 in; 73.15 cm
Maximum Diameter	12.0 in; 30.48 cm
Weight (approximate)	98 lb; 44.5 kg
Operating Position	Vertical only

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
—	Switch Tube (Maximum regulation range 20 kv)	100,000	90	—	—	—	—	—
—	Pulse Modulator	100,000	90†	83,000*	1000	80	—	6400‡

*Anode voltage during conduction = 3000 volts.

†Peak cathode current.

‡Peak power to the load.

The 9008 is a member of Varian's EIMAC Megawatt family of "Super Power" Power Grid Tubes. In view of the value of these tubes, Varian engineers have chosen to equip each member of this family with an extra device which provides both a diagnostic and a system interlock; i.e., a device which assists the user in achieving optimum performance and in preventing serious tube damage. The addition of a mini (-0.1 1/s) Vac-Ion pump allows the user to determine the effect of a specific set of operating conditions on the tube's vacuum. A change in operating conditions accompanied by an increase in pressure indicates that the new operating conditions caused an increase in temperature of one or more of the tube's components; the degree and rate of pressure increase can be used to determine what action should be taken to avoid damage to the tube.

9009/4CPW1000KA



The 9009 is a water-cooled power tetrode intended for use as a pulse modulator or in pulse regulator service.

The tube is rated for 150 kVdc hold-off in a protective atmosphere, with a 90 amperes pulse cathode current rating during conduction and a 1000 kilowatt anode dissipation rating (average during the pulse).

Peak anode current capability in excess of 150 amperes for short pulse operation is practical.

CHARACTERISTICS

Plate Dissipation (Max.)	1,000,000 watts
Screen Dissipation (Max.)	3,500 watts
Grid Dissipation (Max.)	1,500 watts
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	12.0 volts
Current	660 amperes
Capacitances (Gnd. Cath. Connection)	
Input	770 pF
Output	50 pF
Feed-through	4.0 pF
Amplification Factor ($g_1 - g_2$)	4.5
Recommended SF-6 Containment Hood	SK-2306
Base	Special
Recommended Connectors:	
Filament (2 Required)	SK-1711
Control Grid (1 Required)	SK-1712
Maximum Seal & Anode Core Temperature	200°C
Maximum Length	31.0 in; 79.0 cm
Maximum Diameter	17.00 in; 43.18 cm
Weight (approximate)	175 lb; 80 kg
Operating Position	Vertical only

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
—	Switch Tube (Maximum regulation range 20 Kv)	150,000	90†	—	—	—	—	—
—	Pulse Modulator	150,000	90†	120,000*	1500	50	—	5800‡

*Anode voltage during conduction = 4000 volts.

†Peak cathode current.

‡Peak power to the load.

The 9009 is a member of Varian's EIMAC Megawatt family of "Super Power" Power Grid Tubes. In view of the value of these tubes, Varian engineers have chosen to equip each member of this family with an extra device which provides both a diagnostic and a system interlock; i.e., a device which assists the user in achieving optimum performance and in preventing serious tube damage. The addition of a mini (-0.1 1/s) Vac-Ion pump allows the user to determine the effect of a specific set of operating conditions on the tube's vacuum. A change in operating conditions accompanied by an increase in pressure indicates that the new operating conditions caused an increase in temperature of one or more of the tube's components; the degree and rate of pressure increase can be used to determine what action should be taken to avoid damage to the tube.

9013/Y-676A



The Y-676A is intended for use in pulse modulator or pulse regulator service. It is rated for 75 kV holdoff in a protective atmosphere, with 150 amperes peak cathode current rating during conduction for short pulses. Anode dissipation is 100 kW.

CHARACTERISTICS

Plate Dissipation (Max.)	100,000 Watts
Screen Dissipation (Max.)	1,750 Watts
Grid Dissipation (Max)	500 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 volts
Current	215 amperes
Capacitances (Grounded Cathode Connection)	
Input	430 pF
Output	60.0 pF
Feed-through	1.5 pF
Amplification Factor (g_1g_2)	4.5
Base	Special Coaxial
Recommended Air System Socket	SK-2011 A
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	15.97 in; 40.56 cm
Maximum Diameter	9.53 in; 24.2 cm
Weight (approximate)	50.0 lb; 22.7 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
—	Pulse Modulator	75,000	150	60,000*	1,000	60†	—	3,420‡

*Anode voltage during conduction = 3000V.

†Peak cathode current.

‡Peak power to the load.

4CPW1000KB/X-2062M



The 4CPW1000KB is a water-cooled power tetrode intended for use as a pulse modulator or pulse regulator.

The tube is rated for 175 kVdc holdoff in a protective atmosphere, with a 75 ampere pulse-cathode current rating during conduction and a 1000 kilowatt anode dissipation rating (average during the pulse).

Peak anode current capability in excess of 100 amperes for short-pulse operation is practical.

CHARACTERISTICS

Plate Dissipation (Max.)	1,000,000 Watts
Screen Dissipation (Max.)	3,500 Watts
Grid Dissipation (Max)	1,500 Watts
Cooling	Water and Forced Air
Filament	Thoriated Tungsten
Voltage	12.0 Volts
Current	660 amperes
Capacitances (Grounded Cathode Connection)	
Input	770 pF
Output	45.0 pF
Feed-through	4.0 pF
Amplification Factor (g_1g_2)	4.5
Recommended SF-6 Containment Hood	SK-2306
Base	Special
Recommended Connectors:	
Filament (2 required)	SK-1711
Control Grid (1 required)	SK-1712
Maximum Seal & Anode Core Temperature	200°C
Maximum Length	31.0 in; 78.74 cm
Maximum Diameter	17.0 in; 43.18 cm
Weight (approximate)	175 lb; 80 kg
Operating Position	Vertical only

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
—	Switch Tube (Maximum regulation range 20 kV)	175,000	75†	—	—	—	—	—
—	Pulse Modulator	175,000	75†	150,000*	1,000	45	—	6,600‡

*Anode voltage during conduction = 4,000 volts.

†Peak cathode current.

‡Peak power to the load.

The 4CPW1000KB/X-2062M is a member of Varian's EIMAC Megawatt family of "Super Power" Power Grid Tubes. In view of the value of these tubes, Varian engineers have chosen to equip each member of this family with an extra device which provides both a diagnostic and a system interlock; i.e., a device which assists the user in achieving optimum performance and in preventing serious tube damage. The addition of a mini (-0.1 1/s) Vac-Ion pump allows the user to determine the effect of a specific set of operating conditions on the tube's vacuum. A change in operating conditions accompanied by an increase in pressure indicates that the new operating conditions caused an increase in temperature of one or more of the tube's components; the degree and rate of pressure increase can be used to determine what action should be taken to avoid damage to the tube.

4CW1400KG/X2242



The EIMAC 4CW1400KG is a ceramic/metal, water-cooled power tetrode designed for very-high-powered RF service.

The 4CW1400KG has a high-density thoriated-tungsten mesh filament mounted on water-cooled supports. Pyrolytic graphite control and screen grids are used to provide the necessary stability and power dissipation ratings. The maximum anode dissipation rating is 1400 kilowatts steady state.

Large-diameter coaxial terminals are used for the control grid and the RF cathode terminals. Filament power and filament support cooling-water connections are made through two special connectors. Anode cooling water connections are made with available hand-tightened connectors.

CHARACTERISTICS

Plate Dissipation (Max.)	1,400,000 Watts
Screen Dissipation (Max.)	20,000 Watts
Grid Dissipation (Max.)	8,000 Watts
Frequency for Max. Ratings (CW)	65 MHz
Maximum Useful Frequency	150 MHz
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 volts
Current	675 amperes
Capacitances (Grounded Cathode Connection)	
Input	1150 pF
Output	150 pF
Feed-through	5.0 pF
Amplification Factor ($g_1 - g_2$)	6
Base	Special Coaxial
Recommended Filament Power/Water:	
Connectors (2 required)	SK-2310
Recommended Filament RF:	
Connector (1 required)	SK-2315
Recommended Anode Water:	
Connectors (2 required)	SK-2320 or SK-2321 or SK-2322
Maximum Seal & Envelope Temperature	200°C
Maximum Length	18.75 in; 476.20 mm
Maximum Diameter	17.03 in; 432.60 mm
Weight (approximate)	153.0 lb; 69.5 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Screen Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (kW)
B or AB	RF Power Amplifier (grounded grid)	27,000	200	24,000	1250	128	68,000	2300

4CPW100KA/Y841



The 4CPW100KA is a ceramic/metal, water-cooled high power tetrode intended for use as a pulse modulator or in regulator service. Its rugged mesh thoriated tungsten filament provides ample emission for 100 amp peak current rating. The 4CPW100KA is rated at 110 kilovolts in a protective atmosphere or with oil immersion between the anode and screen grid terminal.

The water-cooled anode is rated for a maximum dissipation of 100 kilowatts. Available accessories are a tube support plate, an air-system socket, and containment hood for protective atmosphere.

CHARACTERISTICS

Plate Dissipation (Max.)	100,000 watts
Screen Dissipation (Max.)	1,750 watts
Grid Dissipation (Max.)	500 watts
Cooling	Water and Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	15.5 volts
Current	215 amperes
Capacitances (Gnd. Cath. Connection)	
Input	470 pF
Output	40 pF
Feed-through	0.5 pF
Amplification Factor ($g_1 - g_2$)	4.5
Base	Special Coaxial
Recommended Socket	YC116
Recommended SF ₆ Containment Hood	YC117
Maximum Seal & Envelope Temperature	250°C
Maximum Length	18.1 in; 45.9 cm
Maximum Diameter	13.9 in; 35.3 cm
Weight (approximate)	50 lb; 22.7 kg
Operating Position	Vertical, base down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)*	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (kW)
—	Pulse Modulator	110,000	100†	90,000*	50	1500	—	4350‡

* Anode voltage during conduction = 3000V.

† Peak cathode current.

‡ Peak power to the load.

YU-155

The YU-155 is intended for use in pulse modulator or regulator service. This high vacuum, radial-beam tetrode is recommended for use in equipment where high duty, high voltage, or high current is encountered.



CHARACTERISTICS

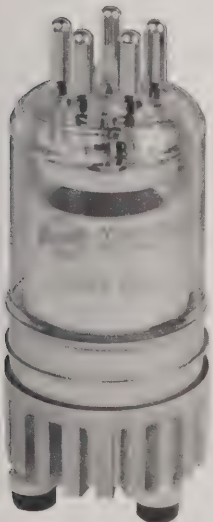
Plate Dissipation (Max.)	1500 watts
Grid Dissipation (Max.)	25 watts
Screen Dissipation	75 watts
Cooling	Conduction in Oil
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	17.0 amperes
Capacitances (Grounded Grid Connection)	
Input	13.0 pF
Output	22.0 pF
Feed-through	7.5 pF
Amplification Factor	6.5
Base	5-Pin Special
Maximum Envelope Temperature	150°C
Maximum Anode Temperature	250°C
Maximum Length	8.27 in; 210 mm
Maximum Diameter	5.32 in; 135 mm
Weight (approximate)	12 lb; 5.5 kg
Operating Position	Vertical, base up or down

MAXIMUM RATINGS			
Peak Plate Voltage (kV)*	DC Control Voltage (kV)*	DC Screen Voltage (kV)	Pulse Anode Current (A)
100	-1	1	5

* In oil

YU-179

The YU-179 is intended for use in pulse modulator or regulator service. This high vacuum, radial-beam tetrode is recommended for use in equipment where high duty, high voltage, or high current is encountered.



CHARACTERISTICS

Plate Dissipation (Max.)	1000 Watts
Grid Dissipation (Max.)	25 Watts
Screen Grid Dissipation	75 Watts
Cooling	Oil
Filament	Thoriated-Tungsten
Voltage	7.5 volts
Current	17.0 amperes
Capacitances (Grounded Cathode Connection)	
Cathode/Control Grid	13.0 pF
Control Grid/Screen Grid	19.0 pF
Screen Grid/Anode	6.0 pF
Amplification Factor	7.0
Base	5 Pin Special
Maximum Envelope Temperature	150°C
Maximum Anode Temperature	250°C
Maximum Length	7.7 in; 195 mm
Maximum Diameter	3.5 in; 90 mm
Weight (approximate)	8 lb; 2.6 kg
Operating Position	Vertical, base up or down

MAXIMUM RATINGS				
Peak Plate Voltage (kV)*	DC Control Voltage (kV)*	DC Screen Voltage (kV)	Pulse Anode Current (A)	Duty
85	-1	1	5	.01

* In oil

4-65A/8165



The 4-65A/8165 is a small radial-beam tetrode. In most applications, no forced air is required, normal radiation and convection cooling being adequate.

Short, heavy leads and low inter-electrode capacities permit its use at maximum ratings through 150 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	65 watts
Screen Dissipation (Max.)	10 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW)	150 MHz
Cooling	Convection & Radiation
Filament	Thoriated Tungsten
Voltage	6.0 volts
Current	3.5 amperes
Capacitances (Gnd. Cath. Connection):	
Input	7.1 pF
Output	2.3 pF
Feed-through	0.1 pF
Amplification Factor (g_1-g_2)	6
Base	5-Pin Special
Recommended Heat Dissipating Connector	HR-6
Maximum Seal Temperature	200°C
Maximum Envelope Temperature	225°C
Maximum Length:	4.37 in; 111.00 mm
Maximum Diameter:	2.36 in; 60.40 mm
Weight (approximate)	3 oz; 85.0 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	3000	0.15	3000	250	0.11	1.6	270
C	RF Amplifier Plate Modulated	2500	0.12	2500	250	0.10	3.1	210
AB ₁	RF Linear Amplifier	3000	0.15	3000	400	0.06	—	120
AB ₁	AF Amplifier or Modulator	3000	0.15	3000	400	0.12*	—	240*

*Two tubes.

4-125A/4D21



The 4-125A/4D21 is intended for use as an amplifier, oscillator, or modulator. It has a maximum plate voltage rating of 3 kV at frequencies up to 120 MHz.

CHARACTERISTICS

Plate Dissipation (Max.)	125 watts
Screen Dissipation (Max.)	20 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (CW)	120 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	6.5 amperes
Capacitances (Gnd. Cath. Connection):	
Input	10.8 pF
Output	3.1 pF
Feed-through	0.05 pF
Amplification Factor (g_1-g_2)	5.9
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Heat Dissipating Connector	HR-6
Maximum Seal Temperature	200°C
Maximum Envelope Temperature	225°C
Maximum Length:	5.69 in; 144.50 mm
Maximum Diameter:	2.81 in; 71.40 mm
Weight (approximate)	6.5 oz; 184.0 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	3000	0.22	3000	350	0.17	2.5	375
C	RF Amplifier Plate Modulated	2500	0.20	2500	350	0.15	3.3	300
AB ₁	AF Amplifier or Modulator	3000	0.22	2500	600	0.23*	—	330*
AB ₂	AF Amplifier or Modulator	3000	0.22	2500	350	0.26*	2.4	400*

*Two tubes.

4-250A/5D22



The 4-250A/5D22 is intended for use as an amplifier, oscillator or modulator. The low grid-plate capacitance of this tetrode coupled with its low driving-power requirement allows considerable simplification of the associated circuit and driver stage.

The 4-250A/5D22 is cooled by radiation from the plate and by circulation of forced-air through the base, around the envelope, and over the plate seal.

CHARACTERISTICS

Plate Dissipation (Max.)	250 watts
Screen Dissipation (Max.)	35 watts
Grid Dissipation (Max.)	10 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.5 amperes
Capacitances (Gnd. Cath. Connection):	
Input	12.7 pF
Output	4.5 pF
Feed-through	0.12 pF
Amplification Factor (g_1-g_2)	5.1
Transconductance†	4000 μ mhos
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Air Chimney	SK-406
Recommended Heat Dissipating Connector	HR-6
Maximum Plate Seal Temperature	200°C
Maximum Base Seal Temperature	170°C
Maximum Length:	6.38 in; 162.00 mm
Maximum Diameter:	3.56 in; 90.40 mm
Weight (approximate)	8 oz; 227 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	4000	0.35	4000	500	0.31	2.5	1000
C	RF Amplifier Plate Modulated	3200	0.27	3000	400	0.23	3.2	510
AB ₁	RF Linear Amplifier	4000	0.35	3000	600	0.20	—	350
AB ₁	AF Amplifier or Modulator	4000	0.35	3000	600	0.42*	—	750*
AB ₂	AF Amplifier or Modulator	4000	0.35	3000	300	0.47*	4.6	1040*

*Two tubes.

†At $I_b = 100$ mA.



The 4-400C/6775 and the 4-400A/8438 are intended for use as amplifiers, oscillators or modulators. The low grid-plate capacitance of these tetrodes coupled with their low driving power requirement allow considerable simplification of the associated circuit and driver stage.

The 4-400C/6775 and the 4-400A/8438 are cooled by radiation from the plate and by circulation of forced-air through the base, around the envelope, and over the plate seal. Cooling can be greatly simplified by using and EIMAC SK-410 Air-System Socket and its accompanying glass chimney.

The 4-400C/6775 is especially recommended for applications where long life and consistent performance are of prime importance.

4-400A/8438

4-400C/6775

CHARACTERISTICS

Plate Dissipation (Max.)	400 watts
Screen Dissipation (Max.)	35 watts
Grid Dissipation (Max.)	10 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.7 amperes
Capacitances (Gnd. Cath. Connection):	
Input	12.5 pF
Output	4.7 pF
Feed-through	0.12 pF
Amplification Factor (g_1-g_2)	5.1
Transconductance†	4000 μ mhos
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Air Chimney	SK-406
Recommended Heat Dissipating Connector	HR-6
Maximum Plate Seal Temperature	225°C
Maximum Base Seal Temperature	200°C
Maximum Length:	6.38 in; 162.00 mm
Maximum Diameter:	3.56 in; 90.40 mm
Weight (approximate)	9.0 oz; 255 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 75 MHz	4000	0.35	4000	500	0.35	5.8	1100
C	RF Amplifier at 110 MHz	4000	0.35	4000	500	0.54*	20	1440††
C	RF Amplifier Plate Modulated at 75 MHz	3200	0.27	3000	500	0.27	3.5	630
AB ₁	RF Linear Amplifier at 75 MHz	4000	0.35	3000	750	0.29	—	470††
AB ₁	AF Amplifier or Modulator	4000	0.35	4000	750	0.59*	—	1540*
AB ₂	AF Amplifier or Modulator	4000	0.35	4000	500	0.64*	7.0	1750*

*Two tubes.

††Useful Output Power.

†At $I_b = 100$ mA.

4-1000A/8166



The 4-1000A/8166 is intended for use as an amplifier, oscillator, or modulator and is capable of efficient operation well into the VHF range.

In FM broadcast service on 110 MHz, two 4-1000A/8166 tetrodes will deliver a useful output power of over 5 kW.

Cooling of the tube is accomplished by radiation from the plate and by circulation of forced-air through the base and around the envelope. Cooling can be simplified through the use of an EIMAC SK-510 Air-System Socket and its accompanying glass chimney.

CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Screen Dissipation (Max.)	75 watts
Grid Dissipation (Max.)	25 watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	21.3 amperes
Capacitances (Gnd. Cath. Connection):	
Input	28.1 pF
Output	8.1 pF
Feed-through	0.3 pF
Amplification Factor ($g_1 - g_2$)	6.9
Transconductance	10,000 μ mhos
Base	5-Pin Special
Recommended Air-System Socket	SK-510
Recommended Air Chimney	SK-506
Recommended Heat Dissipating Connector	HR-8
Maximum Seal Temperature	200°C
Maximum Envelope Temperature	225°C
Maximum Length:	9.63 in; 244.60 mm
Maximum Diameter:	5.25 in; 133.30 mm
Weight (approximate)	1.5 lb; 0.68 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	6000	0.70	6000	500	0.70	15	3400
C	RF Amplifier at 110 MHz	6000	0.70	6000	500	1.25*	400	5200*†
C	RF Amplifier Plate Modulated at 30 MHz	5000	0.60	5000	500	0.60	11	2440†
AB ₁	AF Amplifier or Modulator	6000	0.70	6000	1000	0.95*	—	3840*
AB ₂	AF Amplifier or Modulator	6000	0.70	6000	500	0.95*	9.4	3900*

*Two tubes.

†Useful Output Power.

4PR60C/8252W



The 4PR60C/8252W is intended for pulse-modulator service in circuits employing inductive or resistive loads. This tube unilaterally replaces the 715C, the 5D21 and the 4PR60B/8252. The internal structure of the tube has been strengthened to minimize the effects of shock and vibration.

The 4PR60C/8252W has a maximum plate dissipation rating of 60 watts, is cooled by radiation and convection, and delivers pulse output power in the region of 300 kW with less than one kW of pulse driving power.

CHARACTERISTICS

Plate Dissipation (Max.)	60 watts
Screen Dissipation (Max.)	8 watts
Grid Dissipation (Max.)	1 watt
Cooling	Radiation & Forced Air
Cathode	Oxide-coated Unipotential
Voltage	26.0 volts
Current	2.1 amperes
Capacitances (Gnd. Cath. Connection):	
Input	43.0 pF
Output	8.5 pF
Feed-through	1.5 pF
Base	4-Pin Special
Recommended Heat Dissipating Connector	HR-8
Maximum Seal & Envelope Temperature	200°C
Maximum Length:	6.00 in; 152.40 mm
Maximum Diameter:	3.06 in; 77.90 mm
Weight (approximate)	12 oz; 0.34 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
—	Switch Tube or Pulse Modulator	20,000	18.0*	20,000	1250	18.0*	—	337,000*

*During the pulse.

4PR250C/8248

The 4PR250C/8248 is intended for use in pulse-modulator, switch tube, pulsed-amplifier, and pulsed-oscillator service. This compact, high vacuum, radial-beam tetrode, incorporating a tantalum plate and non-emitting grids, is recommended for use where voltages to 50 kV are required.

CHARACTERISTICS

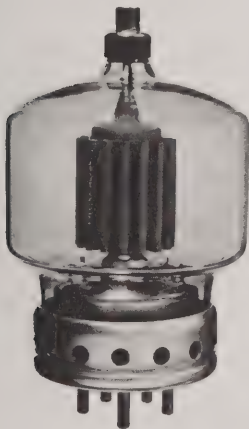
Plate Dissipation (Max.)	250 watts
Screen Dissipation (Max.)	25 watts
Grid Dissipation (Max.)	5 watts
Frequency for Max. Ratings (Pulsed)	100 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.7 amperes
Capacitances (Gnd. Cath. Connection):	
Input	13.0 pF
Output	3.3 pF
Feed-through	0.12 pF
Amplification Factor ($g_1 - g_2$)	5.1
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Heat Dissipating Connector	HR-8
Maximum Seal & Envelope Temperature	200°C
Maximum Length:	7.63 in; 193.70 mm
Maximum Diameter:	3.59 in; 91.30 mm
Weight (approximate)	12.5 oz; 355 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	35,000	5.5*	35,000†	1500†	0.9†	4.5‡	26,500†
C	RF Amplifier Grid Pulsed	25,000	5.5*	25,000	1500	0.94†	4.7†	19,000†
—	Switch Tube or Pulse Modulator	50,000	4.0	50,000	1500	4.0†	25†	192,000†

*Cathode peak current.

†Pulse values.

‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

4PR400A/8188

The 4PR400A/8188 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact tetrode is recommended for use in new equipments where high voltage, high current, or high duty factor is encountered.

Cooling of the tube is accomplished by radiation from the plate and by circulation of forced air through the base and around the envelope. Cooling can be simplified by the use of the EIMAC SK-410 Air System Socket and the SK-406 Air Chimney.

CHARACTERISTICS

Plate Dissipation (Max.)	400 watts
Screen Dissipation (Max.)	35 watts
Grid Dissipation (Max.)	10 watts
Frequency for Max. Ratings (Pulsed)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	5.0 volts
Current	14.7 amperes
Capacitances (Gnd. Cath. Connection):	
Input	12.5 pF
Output	4.7 pF
Feed-through	0.12 pF
Amplification Factor ($g_1 - g_2$)	5.1
Base	5-Pin Special
Recommended Air-System Socket	SK-410
Recommended Air Chimney	SK-406
Recommended Heat Dissipating Connector	HR-6
Maximum Seal & Envelope Temperature	200°C
Maximum Length:	6.37 in; 161.90 mm
Maximum Diameter:	3.56 in; 90.50 mm
Weight (approximate)	9.0 oz; 255.0 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	15,000	5.4*	15,000†	1500†	0.87†	9.0‡	10,500†
C	RF Amplifier Grid Pulsed	10,000	5.4*	10,000	1500	0.87†	8.5†	6,600†
—	Switch Tube or Pulse Modulator	20,000	4.0	20,000	1500	3.5†	35†	64,000†

*Cathode peak current.

†Pulse Value.

‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

4PR1000A/8189

The 4PR1000A/8189 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact, tetrode is recommended for use in new equipments where high voltage, high current, or high duty factor is encountered.

Cooling is accomplished by radiation from the plate and by circulation of forced air through the base and around the envelope. Cooling is simplified by the use of the EIMAC SK-510 Air-System Socket and the SK-506 Air Chimney.

CHARACTERISTICS

Plate Dissipation (Max.)	1000 watts
Screen Dissipation (Max.)	75 watts
Grid Dissipation (Max.)	25 watts
Frequency for Max. Ratings (Pulsed)	110 MHz
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	7.5 volts
Current	21.3 amperes
Capacitances (Gnd. Cath. Connection):	
Input	28.1 pF
Output	8.1 pF
Feed-through	0.25 pF
Base	5-Pin Special
Recommended Air-System Socket	SK-510
Recommended Air Chimney	SK-506
Recommended Heat Dissipating Connector	HR-8
Maximum Seal & Envelope Temperature	200°C
Maximum Length	9.62 in; 244.50 mm
Maximum Diameter	5.25 in; 133.30 mm
Weight (approximate)	1.5 lb; 0.68 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier Plate and Screen Pulsed	20,000	8	20,000†	1500†	1.95†	15.7‡	31,500†
C	RF Amplifier Grid Pulsed	15,000	8	15,000	1500	1.95†	15.2†	23,000†
—	Switch Tube or Pulse Modulator	30,000	8†	30,000	1500	8.0†	116†	220,000†

†Pulse Value.

‡When used as a plate and screen pulsed amplifier, the grid drive must also be pulsed to avoid overheating the grid.

8960

The 8960 is designed for high power pulse modulator or switch tube service, operating at voltages up to 50 kVdc or anode current as high as 12 amperes.

Cooling is accomplished by radiation from the plate and by circulation of forced air through the base and around the envelope. Cooling is simplified by use of the EIMAC SK-510 Air-System Socket and the SK-506 Air Chimney.

CHARACTERISTICS

Plate Dissipation (Max.)	1200 Watts
Screen Dissipation (Max.)	75 Watts
Grid Dissipation (Max.)	25 Watts
Cooling	Radiation & Forced Air
Filament	Thoriated Tungsten
Voltage	7.0 volts
Current	36.0 amperes
Capacitances (Grounded Cathode Connection)	
Input	28.0 pF
Output	6.3 pF
Feed-through	0.30 pF
Amplification Factor ($g_1 - g_2$)	7
Base	5-Pin Special
Recommended Air-System Socket	SK-510
Recommended Air Chimney	SK-506
Recommended Heat Dissipating Connector	HR-8
Maximum Seal & Envelope Temperature	200°C
Maximum Length	9.62 in; 24.48 mm
Maximum Diameter	5.25 in; 13.33 mm
Weight (approximate)	1.5 lb; 0.68 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
—	Pulse Modulator or Switch Tube	50,000	12 •	45,000	1500	10 •	75	425,000

• Peak value.

4X600/YU-118



The 4X600/YU-118 is intended for use in pulse-modulator, pulsed-amplifier, and pulsed-oscillator service. This compact, high vacuum, radial-beam tetrode is recommended for use in new equipment where high voltage, high current, or high duty factor is encountered.

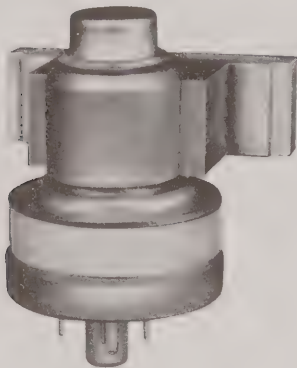
CHARACTERISTICS

- Plate Dissipation (Max.) 600 Watts
- Screen Dissipation (Max.) 25 Watts
- Grid Dissipation (Max) 5 Watts
- Frequency for Max. Ratings (Pulsed) 110 MHz
- Cooling Radiation & Forced Air
- Filament Thoriated Tungsten
 - Voltage 5.0 volts
 - Current 14.6 amperes
- Capacitances (Grounded Cathode Connection)
 - Input 13.2 pF
 - Output 4.1 pF
 - Feed-through 0.1 pF
- Amplification Factor ($g_1 - g_2$) 5.1
- Base 5-Pin Special
- Recommended Air-System Socket SK-410
- Recommended Air Chimney SK-526
- Maximum Seal & Envelope Temperature 200°C
- Maximum Length 6.4 in; 16.26 cm
- Maximum Diameter 3.85 in; 9.63 cm
- Weight (approximate) 2.0 lb; 0.9 kg
- Operating Position Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		PULSE OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
—	Switch Tube or Pulse Modulator	30,000	4.0†	20,000	1500	3.5†	35	64,000

† Pulse value

4CS250R



The 4CS250R is electrically identical to the 4CX250R except that the maximum dissipation of the 4CS250R is limited only by the maximum allowable anode and ceramic/metal seal temperatures. A beryllium oxide (BeO) thermal link is brazed to the anode providing an electrically isolated, low thermal resistance path between the anode and the heat sink. Ruggedized construction allows the 4CS250R to be operated in applications where shock and/or vibration is experienced.

CHARACTERISTICS

Plate Dissipation (Max.)	Dependent on Cooling Technique
Screen Dissipation (Max.)	12 Watts
Grid Dissipation (Max.)	2 Watts
Frequency for Max. Ratings (Pulsed)	500 MHz
Cooling	Conduction
Filament	Oxide-coated Unipotential
Voltage	6.0 volts
Current	2.6 amperes
Capacitances (Grounded Cathode Connection)	
Input	17.0 pF
Output	4.7 pF
Feed-through	0.04 pF
Base	9-Pin Special
Recommended Socket	SK-660A
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.46 in; 62.60 mm
Maximum Diameter	1.76 in; 44.90 mm
Weight (approximate)	5 oz; 141.7 gm
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 175 MHz	2000	0.25	2000	250	0.24	1.1	379
C	RF Amplifier Plate Modulated	1500	0.20	1500	250	0.20	1.7	235
AB ₁	RF Linear Amplifier	2000	0.25	2000	400	0.24	—	470†
AB ₁	AF Amplifier or Modulator	2000	0.25	2000	350	0.50*	—	595*

*Two tubes.

†Useful PEP Output Power.

8560AS



The 8560AS is intended for use as an RF amplifier or oscillator or in audio amplifier or modulator service. It has electrical characteristics similar but not identical to the 4CX250B/7203.

The 8560AS is designed for conduction cooling and is nominally rated for 200 watts anode dissipation. A thermal link is available to insulate the anode from the heat sink while allowing for heat conduction from the anode to the sink.

CHARACTERISTICS

Plate Dissipation ¹ (Max.)	200 Watts
Screen Dissipation (Max.)	12 Watts
Grid Dissipation (Max.)	2 Watts
Frequency for Max. Ratings (Pulsed)	500 MHz
Cooling	Conduction
Filament	Oxide-coated Unipotential
Voltage	6.3 volts
Current	2.6 amperes
Capacitances (Grounded Cathode Connection)	
Input	16.5 pF
Output	4.6 pF
Feed-through	0.04 pF
Amplification Factor ($g_1 - g_2$)	5
Base	9-Pin Special
Recommended Air System Socket	EIMAC SK-660A Series
Recommended BeO Thermal Link	SK-1920
Maximum Seal & Anode Core Temperature	250°C
Maximum Length	2.45 in; 62.1 mm
Maximum Diameter	1.63 in; 41.4 mm
Weight (approximate)	8.2 oz; 235 gm
Operating Position	Any

¹Dissipation capability is dependent upon cooling technique.

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	2,000	0.25	2,000	250	0.25	2.9	390
C	RF Amplifier Plate Modulated	1,500	0.20	1,500	250	0.20	1.7	235
AB ₁	RF Linear Amplifier	2,000	0.25	2,000	350	0.25	—	300†
AB ₁	AF Amplifier or Modulator	2,000	0.25	2,000	350	0.50*	—	600*

*Two tubes

†Useful PEP output power.

5CX1500A

The 5CX1500A is designed for use as a Class AB₁ linear amplifier in audio or radio frequency applications. Its characteristic low intermodulation distortion makes it especially suitable for single sideband service.

The tube is also recommended for use as a Class C RF power amplifier in CW, FM and AM service.

CHARACTERISTICS

Plate Dissipation (Max.)	1500 Watts
Suppressor Dissipation (Max.)	25 Watts
Screen Dissipation (Max.)	75 Watts
Grid Dissipation (Max.)	25 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	5.0 volts
Current	40.0 amperes
Capacitances (Grounded Cathode Connection):	
Input	75.0 pF
Output	16.5 pF
Feed-through	0.2 pF
Capacitances (Grounded Grid Connection):	
Input	34.5 pF
Output	16.5 pF
Feed-through	0.05 pF
Amplification Factor ($g_1 - g_2$)	5.5
Transconductance†	24,000 μ mhos
Base	Special Ring and Breechblock
Recommended Air-System Socket	SK-840
Recommended Air Chimney	SK-806
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.95 in; 125.70 mm
Maximum Diameter:	3.37 in; 85.60 mm
Weight (approximate)	30 oz; 850 gm
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	5000	1.0	4500	500	0.90	9.0	3180
C	RF Amplifier Plate Modulated	3500	0.8	3200	500	0.80	10.0	1958
AB ₁	RF Linear Amplifier	4000	1.0	4000	500	0.70	—	1785
AB ₁	AF Amplifier or Modulator	4000	1.0	3800	500	1.3*	—	3220*

*Two tubes.

†At $I_b = 1.0$ A

5CX1500B

The 5CX1500B is recommended primarily for use as a Class C RF power amplifier in CW, FM and AM service.

The 5CX1500B is recommended as a replacement for the 5CX1500A in broadcast applications.

CHARACTERISTICS

Plate Dissipation (Max.)	1500 Watts
Suppressor Dissipation (Max.)	25 Watts
Screen Dissipation (Max.)	75 Watts
Grid Dissipation (Max.)	25 Watts
Frequency for Max. Ratings (CW)	110 MHz
Cooling	Forced Air
Filament	Thoriated Tungsten Mesh
Voltage	5.0 volts
Current	38.5 amperes
Capacitances (Grounded Cathode Connection):	
Input	75.0 pF
Output	17 pF
Feed-through	0.2 pF
Capacitances (Grounded Grid Connection):	
Input	34.5 pF
Output	19.0 pF
Feed-through	0.05 pF
Amplification Factor ($g_1 - g_2$)	5.5
Transconductance†	24,000 μ mhos
Base	Special Ring and Breechblock
Recommended Air-System Socket	SK-840
Recommended Air Chimney	SK-806
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	4.95 in; 12.57 cm
Maximum Diameter:	3.37 in; 8.56 cm
Weight (approximate)	1.9 lb; 4.2 kg
Operating Position	Vertical, base up or down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	5000	1.0	4500	500	0.9	9.0	3180

5CX3000A/8966



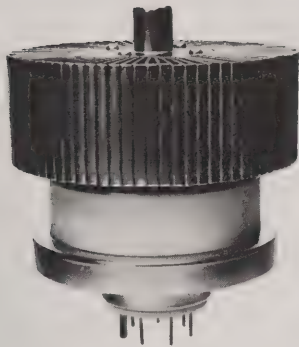
The 5CX3000A is designed for use as a Class AB₁ linear amplifier in audio or radio-frequency applications. Its characteristics of low intermodulation distortion make it especially suitable for single sideband service.

CHARACTERISTICS

- Plate Dissipation (Max.) 4000 Watts
- Suppressor Dissipation (Max.) 100 Watts
- Screen Dissipation (Max.) 175 Watts
- Grid Dissipation (Max.) 50 Watts
- Frequency for Max. Ratings (CW) 110 MHz
- Cooling Forced Air
- Filament Thoriated Tungsten
 - Voltage 9.0 volts
 - Current 41.5 amperes
- Capacitances (Grounded Cathode Connection):
 - Input 135.0 pF
 - Output 21.0 pF
 - Feed-through 0.4 pF
- Capacitances (Grounded Grid Connection):
 - Input 61.0 pF
 - Output 21.0 pF
- Amplification Factor ($\mu_1 - \mu_2$) 5.5
- Base Special Ring and Breechblock
- Recommended Air-System Socket SK-1420
- Recommended Air Chimney SK-1426
- Maximum Seal & Anode Core Temperature 250°C
- Maximum Length: 6.84 in; 173.70 mm
- Maximum Diameter: 4.63 in; 117.60 mm
- Weight (approximate) 5.5 lb; 2.5 kg
- Operating Position Vertical, base up or down

Class of Operation Type of Service		MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier at 30 MHz	7000	2.0	6800	500	1.6	52	8,500
AB ₁	RF Linear Amplifier	7000	2.0	6000	850	1.4	—	5,500
AB ₁	AF Amplifier or Modulator	7000	2.0	6000	850	2.9*	—	11,000*

*Two tubes.

8295A

The 8295A is a forced-air cooled, radial beam pentode capable of high power gain and excellent efficiency at relatively low plate voltage. The 8295A is a direct replacement for the 8295.

This external-anode tube is especially suited for Class AB₁ linear RF amplifier service, but will also provide excellent performance in Class AB₂, Class B and Class C service.

CHARACTERISTICS

Plate Dissipation (Max.)	1000 Watts
Screen Dissipation (Max.)	30 Watts
Grid Dissipation (Max.)	5 Watts
Frequency for Max. Ratings (CW)	30 MHz
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6.0 volts
Current	8.2 amperes
Capacitances (Grounded Cathode Connection):	
Input	40.0 pF
Output	18.5 pF
Feed-through	.09 pF
Base	7-Pin Special
Recommended Air-System Socket	SK-184
Maximum Seal & Anode Core Temperature	250°C
Maximum Length:	5.05 in; 128 mm
Maximum Diameter:	4.03 in; 102 mm
Weight (approximate)	2.8 lb; 1.27 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION				
		Plate Voltage (volts)	Plate Current (amps)	Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	RF Amplifier	3000	1.0	3000	500*	0.82	2.1	1770†
AB ₁	RF Linear Amplifier	3000	0.8	3000	500*	0.80	—	1700†

*Suppressor grid voltage = +35 Vdc.

†Useful Power Output.

ML-6544



The ML-6544 is a shielded-grid triode designed primarily for use as a switch tube in hard-tube pulse modulators for radar applications. It delivers a peak pulse power output of one megawatt with less than 10 kW of driving power. The tube incorporates a beamed electrode structure to minimize driving power. This design avoids the fine-wire grids usually used in tetrodes and provides a rugged structure. The shield grid is strapped to the cathode internally and protects the cathode from transient arcs.

CHARACTERISTICS

Plate Dissipation (Max.)	1,000 Watts
Grid Dissipation (Max.)	25 watts
Cooling	Forced Air
Cathode	Oxide-coated Unipotential
Voltage	6 volts
Current	60.0 amperes
Capacitances (Grounded Grid Connection)	
Input	260.0 pF
Output	40.0 pF
Feed-through	.40 pF
Amplification Factor	90
Base	Special
Maximum Seal & Anode Core Temperature	175°C
Maximum Length	9.375 in; 238.1 mm
Maximum Diameter	5.135 in; 130.4 mm
Weight (approximate)	13 lb; 5.9 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS				TYPICAL OPERATION				
		Plate Voltage (Volts)	Plate Current (Amps)	Duty	Pulse Duration	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (kW)	Output Power (kW)	Duty
---	Pulse Modulator	20kV	0.25	.03	25 μ Sec	18 kV	65	12	1000	.003

ML-6696A



The ML-6696A is a medium-mu triode designed for use in industrial heating and AM broadcast service.

This tube features a coaxial mounting structure and rugged, low-loss ceramic envelope. The water-cooled anode dissipates 60 kW. The robust cathode and rugged design make this tube an excellent choice for demanding applications.

CHARACTERISTICS

Plate Dissipation (Max.)	60,000 watts
Grid Dissipation (Max.)	1,000 watts
Frequency for Max. Ratings (CW):	40 MHz
Cooling	Water & Forced Air
Filament:	Thoriated Tungsten
Voltage	13.0 Volts
Current	205 Amperes
Capacitances (Grounded Cathode Connection)	
Input	76 pF
Output	55 pF
Feed-through	2.7 pF
Amplification Factor	20
Base	Coaxial
Accessories:	
Small Filament Connector:	F17488
Large Filament Connector:	F17489
Grid Connector:	F17397
Water Jacket:	F17393
Maximum Seal Temperature	200°C
Maximum Length	19.4 in; 492.3 mm
Maximum Diameter	5.3 in; 134.5 mm
Weight (approximate)	17 lbs; 7.7 kg
Operating Position	Vertical, anode down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
B	Grid Driven RF Amplifier	16,000	9.0	12,000	6.8	1,500	28,000
C	Grid Driven RF Amplifier Plate Modulated	10,000	8.5	9,500	8.4	2,000	60,000
C	RF Amplifier or Oscillator	16,000	11.0	15,000	7.0	600	80,000

ML-6697A

The ML-6697A is a medium-mu triode designed for use in industrial heating and AM broadcast service.

This tube features a coaxial mounting structure and rugged, low-loss ceramic envelope. The air-cooled anode dissipates 35 kW. The robust cathode and rugged design make this tube an excellent choice for demanding applications.

CHARACTERISTICS

Plate Dissipation (Max.)	35,000 watts
Grid Dissipation (Max.)	1,000 watts
Frequency for Max. Ratings (CW)	40 MHz
Cooling	Forced Air
Filament:	Thoriated Tungsten
Voltage	13.0 Volts
Current	205 Amperes
Capacitances (Grounded Cathode Connection)	
Input	76 pF
Output	55 pF
Feed-through	2.7 pF
Amplification Factor	20
Base	Coaxial
Accessories:	
Small Filament Connector:	F17488
Large Filament Connector:	F17489
Grid Connector:	F17397
Air Distributor	F17759
Maximum Seal Temperature	200°C
Maximum Length	19.9 in; 505.5 mm
Maximum Diameter	5.3 in; 134.5 mm
Weight (approximate)	43 lbs; 19.5 kg
Operating Position	Vertical, anode down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
B	Grid Driven RF Amplifier	16,000	9.0	12,000	4.3	450	18,000
C	Grid Driven RF Amplifier Plate Modulated	10,000	8.5	9,500	8.4	2,000	60,000
C	RF Amplifier or Oscillator	16,000	11.0	15,000	7.0	600	80,000

ML-7003, ML-7003A

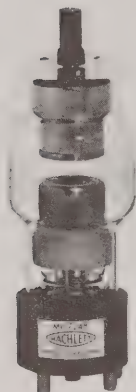
The ML-7003 and its ruggedized version, the ML-7003A, are shielded-grid triodes designed primarily to operate as switch tubes in hard-tube pulse modulators, for radar and similar applications. In this service they can deliver more than two megawatts pulse power output with less than 10 kilowatts driving power. The cathodes are oxide coated.

**CHARACTERISTICS**

Plate Dissipation (Max.)	3,000 Watts
Grid Dissipation (Max.)	25 watts
Cooling	Forced Air and Liquid
Cathode	Oxide
Voltage	6.0 volts
Current	60 amperes
Capacitances (Grounded Grid Connection)	
ML-7003:	
Input	250 pF
Output	22 pF
Feed-through	2.5 pF
ML-7003A:	
Input	230 pF
Output	25 pF
Feed-through	1.6 pF
Amplification Factor	200
Base	Special
Maximum Seal & Anode Core Temperature	175°C
Maximum Length	ML-7003 11.38 in; 289.05 mm
	ML-7003A 11.25 in; 285.75 mm
Maximum Diameter	ML-7003 8.00 in; 203.20 mm
	ML-7003A 8.00 in; 203.20 mm
Weight (approximate)	ML-7003 25.0 lb; 11.37 kg
	ML-7003A 27.0 lb; 12.29 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS				TYPICAL OPERATION				
		Plate Voltage (Volts)	Plate Current (Amps)	Duty	Pulse Duration	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (kW)	Output Power (kW)	Duty
---	Pulse Modulator	45kV	0.60	0.03	25 μ Sec	35 kV	40	3.3	1200	.006

ML-7248



The ML-7248 is a high voltage tetrode designed for use as a switch tube in hard-tube pulse modulators for radar application and as a general purpose electronic switch in high voltage switching and control circuits. The cathode is a thoriated-tungsten filament.

CHARACTERISTICS

Plate Dissipation (Max.) 200 Watts
 Screen Dissipation (Max.) 20 watts
 Grid Dissipation (Max.) 10 Watts
 Frequency for Max Ratings (CW):
 Cooling Oil
 Filament Thoriated-Tungsten
 Voltage 6.3 volts
 Current 11.7 Amperes
 Direct Interelectrode Capacitances-Approx.
 Cathode-Control Grid 6.7 pF
 Cathode-Screen Grid 3.5 pF
 Cathode Plate 0.08 pF
 Plate-Control Grid 0.08 pF
 Plate-Screen Grid 2.0 pF
 Control-Grid Screen 20.0 pF
 Amplification Factor
 Base
 Maximum Seal & Anode Core Temperature 150°C
 Maximum Length 10.70 in; 271.78 mm
 Maximum Diameter 3.63 in; 92.20 mm
 Weight (approximate) 2.5 lb; 1.1 kg
 Operating Position Horizontal or vertical cathode end down

Class of Operation	Type of Service	MAXIMUM RATINGS				TYPICAL OPERATION				
		Plate Voltage (Volts)	Plate Current (Amps)	Duty	Pulse Duration	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)	Duty %
---	Pulse Modulator	125 kV	2.0	TBD By Diss	1000	125 kV	1.02	55	125	.12

ML-7482



The ML-7482 is a general purpose medium-mu triode which is well suited for AM broadcast, pulse applications and industrial heating service.

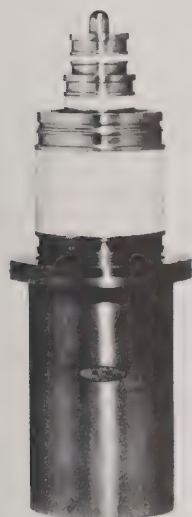
The tube features a coaxial structure and rugged ceramic envelope. The vapor cooled anode will dissipate 200 kW continuously. The rugged construction and efficient vapor cooler make this tube an excellent choice for demanding high power application.

CHARACTERISTICS

Plate Dissipation (Max.) 200,000 Watts
 Grid Dissipation (Max.) 2,500 watts
 Frequency for Max. Ratings (CW): 30 MHz
 Cooling Vapor and Forced Air
 Filament: Thoriated Tungsten
 Voltage 14.5 Volts
 Current 450 Amperes
 Capacitances
 Input 200 pF
 Output 75 pF
 Feed-through 4 pF
 Amplification Factor 45
 Base Coaxial
 Accessories:
 Small Filament Connector: F27218
 Large Filament Connector: F27219
 Grid Connector: F27220
 Maximum Seal Temperature 165°C
 Maximum Length 26.3 in; 668.0 mm
 Maximum Diameter 11.4 in; 289.6 mm
 Weight (approximate) 120 lbs; 54.5 kg
 Operating Position Vertical, anode down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
AB	Grid Driven Linear RF Amplifier	20,000	35	20,000	9.6	5000	115,000
C	Plate Modulated RF Amplifier	15,000	20	14,000	20.5	5700	220,000
C	RF Power Amplifier or Oscillator	20,000	35	20,000	29	6000	440,000

ML-7560



The ML-7560 is a general purpose medium-mu triode which is well suited for AM broadcast, pulse applications and industrial heating service.

The tube features a coaxial structure and rugged ceramic envelope. The water cooled anode will dissipate 175 kW continuously. The rugged construction makes this tube an excellent choice for demanding high power applications.

CHARACTERISTICS

Plate Dissipation (Max.)	175,000 Watts
Grid Dissipation (Max.)	2,500 watts
Frequency for Max. Ratings (CW):	30 MHz
Cooling	Water and Forced Air
Filament:	Thoriated Tungsten
Voltage	14.5 Volts
Current	450 Amperes
Capacitances	
Input	200 pF
Output	75 pF
Feed-through	4 pF
Amplification Factor	45
Base	Coaxial
Accessories:	
Small Filament Connector:	F27218
Large Filament Connector:	F27219
Grid Connector:	F27220
Maximum Seal Temperature	165°C
Maximum Length	29.5 in; 749.3 mm
Maximum Diameter	10.0 in; 254.0 mm
Weight (approximate)	110 lbs; 50.0 kg
Operating Position	Vertical, anode down

Class of Operation	Type of Service	MAXIMUM RATINGS		TYPICAL OPERATION			
		Plate Voltage (Volts)	Plate Current (Amps)	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)
AB	Grid Driven Linear RF Amplifier	20,000	35	20,000	9.6	5000	115,000
C	Plate Modulated RF Amplifier	15,000	20	14,000	20.5	5700	220,000
C	RF Power Amplifier or Oscillator	20,000	35	20,000	29	6000	440,000
C	Plate Pulsed RF Amplifier	40,000*	100*	40,000*	100*	45,000*	3,000,000*

* = pulse values

ML-7715, ML-LPT-62

CHARACTERISTICS

The ML-7715 and its ruggedized version, the ML-LPT-62, are shielded-grid triodes designed primarily for use as switch tubes in hard-tube pulse modulators for radar applications. They can deliver a peak pulse power output of 3.5 megawatts with less than 7 kilowatts driving power. The maximum ratings of 65 kVdc and 70 kV peak apply when the tube is completely immersed in a suitable dielectric fluid such as sulfur hexafluoride or a mineral oil. The cathode is oxide coated.



Plate Dissipation (Max.)	3,000 Watts
Grid Dissipation (Max.)	25 Watts
Cooling	Forced Air & Liquid
Cathode	Oxide-coated Unipotential
Voltage:	
ML-7715	6.0 volts
ML-LPT-62	6.3 volts
Current:	
ML-7715	60.0 Amperes
ML-LPT-62	62.0 Amperes
Capacitances (Grounded Cathode Connection)	
ML-7715:	
Grid/Plate	2.0 pF
Grid/Cathode	250.0 pF
Plate/Cathode	20.0 pF
ML-LPT-62:	
Grid/Plate	1.2 pF
Grid/Cathode	275.0 pF
Plate/Cathode	20.0 pF
Amplification Factor	400
Base	Special
Maximum Seal & Anode Core Temperature	175°C
Maximum Length	11.63 in; 295.4 mm
Maximum Diameter	8.0 in; 203.2 mm
Weight (approximate)	28.0 lb; 12.7 kg
Operating Position	Any

Class of Operation	Type of Service	MAXIMUM RATINGS				TYPICAL OPERATION				
		Plate Voltage (Volts)	Plate Current (Amps)	Duty	Pulse Duration	Plate Voltage (Volts)	Plate Current (Amps)	Drive Power (Watts)	Output Power (Watts)	Duty %
---	Pulse Modulator	65 kV	0.6	.03	10 μ Sec	60 kV	25	1.9 kW	1.3 Mw	.01

REPLACEMENT TYPES

The following EIMAC types currently in production are for renewal use and are not suggested for new equipment design. Data on these tubes may be obtained from the Application Engineering Department of Varian Power Grid & X-Ray Tube Products.

2C39A	4PR1000B	7815	Y-667
2C39BA	4X150A/7034*	7815AL	3CX1000A3
2C39WA	4X150D USE 7609*	7815R/8745	3-400Z/8163
2CX10,000F*	4X150G/8172*	7815RAL	5867A
3CPN10A5-USE 7815	4X500A	7855K	4CV8000A
3CPX100A5-USE 7815R	4-400B/7527	8403	4-65A/8165
3CV30,000A1*	250TH	8533	4-125A/4D21
3CV30,000A3*	250TL	8533W	4-250A/5D22
3CX30,000H3*	264/8576	8538B	4-500A
3CW2000A7	290A	8745/7815R	4-500B
3CW5000A7	304TH	8906	4PR65A/8187
3CW5000F7	304TL	8906AL	4PR125A/8247
3CX100A5-USE 7289	450TH	8907	5-500A
3CX10,000A1-8158*	450TL	8907AL	EE-118
4CN15A*	6155	8944	EE-160AL
4CV35,000A*	6156	Y-799/CCS-1*	EE-181
4CW2000A/8244	7035 USE 7609*	Y-808(4KC/160M)*	EE-23C
4CX125C*	7204 USE 4CX250FG/8621*	8757	EE-58AL
4CX250B1*	7289	Y-579	EE-98L
4CX250F USE 4CX250FG/8621	7609*	Y-579A	3CW2000D3

* To obtain information on these products, please contact Varian Power Grid & X-Ray Tube Products - San Carlos, California location. All other product information is available from the Varian Salt Lake City, Utah location.

ADDITIONAL MACHLETT TYPES

The following Machlett types are currently in production to support equipment being built to current designs and to support replacement requirements. Data on these products can be obtained from the Varian Power Grid & X-ray Tube Products Application Engineering Department in San Carlos, CA.

ML-356	ML-6424
ML-880	ML-6425F
ML-889RA	ML-6426
ML-5658	ML-6627
ML-5667	ML-6696
ML-5771	ML-6697
ML-5681	ML-8773
ML-5682	ML-8795
ML-5918A	ML-23165
ML-5936	ML-23185
ML-6420	ML-23431
ML-6422	ML-23646
ML-6423F	

2KDX15LA/LF, 2DX40LA/LF, 2KDW40LA/LF 2KDW60LA/LF**EIMAC KLYSTRODES® FOR UHF-TV**

The Klystrode provides exceptionally high average conversion efficiency in UHF Television service. The Klystrode electron beam is bunched by an RF cavity-driven grid so it can be operated as a Class B linear amplifier. Because beam input power follows the video waveform, Klystrodes operate in TV service with exceptionally low average beam current. The result is that the electric power bill is cut in half. Klystrode technology also brings the simplicity and cost effectiveness of air cooling to the UHF-TV broadcaster.

TYPICAL PERFORMANCE DATA

OUTPUT POWER KW. SYNC	KLYSTRODE TYPE	SOUND/ VISION	BEAM VOLTAGE KV.	BEAM CURRENT AVERAGE PICTURE A.	DRIVE POWER W. SYNC	COOLING
10	2KDX15LA/LF	Combined ¹	18.2	0.60	50	Air
15	2KDX15LA/LF	Vision	18.2	0.80	75	Air
30	2KDX40LA/LF	Combined ¹	29	0.95	150	Air
40	2KDX40LA/LF	Vision	29	1.05	200	Air
30	2KDW40LA/LF	Combined ¹	29	0.95	150	Water
40	2KDW40LA/LF	Vision	29	1.05	200	Water
40	2KDW60LA/LF	Combined ¹	29	1.25	200	Water
60	2KDW60LA/LF	Vision	32	1.45	300	Water

1. 10% Sound

EIMAC KLYSTRODE® CAVITIES FOR UHF-TV

TYPICAL PERFORMANCE DATA

CAVITY TYPE	OUTPUT POWER KW.	KLYSTRODE TYPE	SOUND/ VISION	BEAM VOLTAGE KV.	BEAM CURRENT AVERAGE PICTURE A.	DRIVE POWER W. SYNC	MAGNET POWER W.	COOLING
CV5200/1	10	2KDX15LA/LF	Combined ¹	18.2	0.60	50	16	Air
CV5200/1	15	2KDX15LA/LF	Vision	18.2	0.80	75	16	Air
CV5500/1	30	2KDX40LA/LF	Combined ¹	29	0.95	150	90	Air
CV5100/1	40	2KDX40LA/LF	Vision	29	1.05	200	90	Air
CV5001	30	2KDW40LA/LF	Combined ¹	29	0.95	150	90	Water
CV5001	40	2KDW40LA/LF	Vision	29	1.05	200	90	Water
CV5000/1	40	2KDW60LA/LF	Combined ¹	29	1.25	200	105	Water
CV5000/1	60	2KDW60LA/LF	Vision	32	1.45	300	105	Water

1. 10% Sound

The UHF-TV band, internationally, covers 470 to 860 MHz. TV Klystrodes with modified cavities will operate down into the VHF range.

EIMAC Cavity Amplifiers Cover 40 to 970 MHz At Power Levels to 60 kW - Our Design or Yours

Varian has complete cavity amplifier design and fabrication capability. We make sure that the EIMAC tube, cavity and end-use are compatible. If it's not an off-the-shelf item, we have the designers and engineers to do your specific job and the construction facilities for volume production.

We have the capability in all disciplines including pulse, CW, FM and TV. We match tube, power, bandwidth and operating mode to achieve optimum performance.

EIMAC cavities are available as a sub-system. This results in substantial savings in development cost and time. To avoid premature system obsolescence, an EIMAC tube and cavity combination should be selected for your particular requirement.

For full details on EIMAC products, or prompt consideration of your special design requirements, contact Varian Power Grid & X-ray Tube Products, 301 Industrial Way, San Carlos, CA 94070 (415) 592-1221. Or call any of the more than 25 Varian Electron Device sales offices throughout the world.

EIMAC Cavity Amplifiers

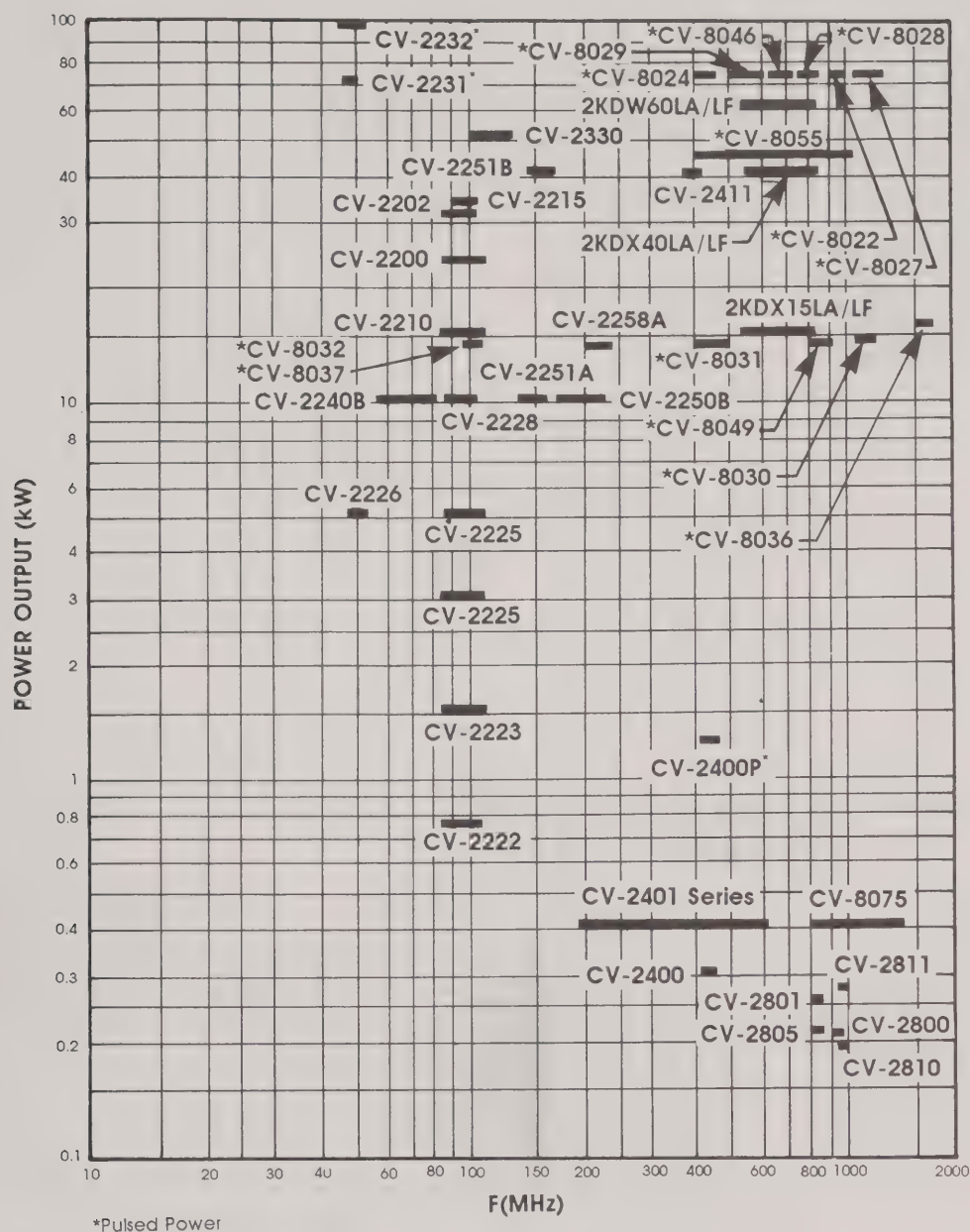
Service	Frequency Range (MHz)	Power (kW)	Tube Type	Cavity
UHF	188-200	0.4	3CX800A7	CV-2407
	280-300	0.4	3CX800A7	CV-2403
	330-370	0.4	3CX800A7	CV-2405
	375-420	0.5	3CX800A7	CV-2402
	390-450	0.4	3CX800A7	CV-2401
	450-470	0.4	3CX800A7	CV-2406
	420-470	0.35	3CX400A7/8874	CV-2400
	420-470	1.25*	Y-805	CV-2400P
	470-530	0.4	3CX800A7	CV-2404
	585-615	0.4	3CX800A7	CV-2408
	825-880	0.30	3CX800U7	CV-2801
	875-935	0.23	3CX400U7	CV-2805
	915-970	0.19	3CX400U7	CV-2810
	915-932	0.30	3CX800U7	CV-2811
TV	57-85	10#	3CX10,000U7	CV-2240B
	170-228	10#	3CX10,000U7	CV-2250B
VHF	49.9	70*	4CX40,000G	CV-2231
	45-55	5.0	4CX3500A	CV-2226
	45-55	100*	Y-676	CV-2232
	140-165	10	3CX10,000U7	CV-2251A
	140-165	40*	3CX10,000U7	CV-2251B
FM	86-108	0.75	3CX800A7	CV-2222
	86-108	1.5	(2) 3CX800A7	CV-2223
	86-108	5.0	4CX3500A	CV-2225
	86-108	10	4CX7500A	CV-2228
	86-108	30	4CX20,000C	CV-2202

* pulse peak

peak sync

Power output levels are nominal. All EIMAC cavities are capable of significantly greater output under the proper operating parameters. Contact Varian Power Grid & X-Ray Tube Products for additional information.

EIMAC CAVITY AMPLIFIER CAPABILITY CHART



EIMAC FM BROADCAST CAVITY AMPLIFIERS

EIMAC cavity amplifiers for FM broadcast service cover the international frequency assignment of 86 to 108 MHz. Five stock amplifiers provide power levels of 30, 10, 5, 1.5 and .75 kW. Other power levels are available on request.

Each of these standard FM power amplifier cavities can be modified for frequency coverage above or below the design range, or adapted for special applications such as AM or pulse service. Consult with Varian Power Grid & X-ray Tube Products, San Carlos, CA for information on special modifications to standard products.

Cavity design is straightforward and relatively simple. If a tetrode tube is used, it is grid driven to provide high stage gain or cathode driven for bandwidth considerations. If a triode tube is used, it is cathode driven to eliminate neutralization. Ample ventilation is provided to prevent cavity detuning due to heat expansion and to protect the tubes. The cavities are easily disassembled for maintenance. Replaceable components are available from Varian or authorized distributors.

CV-2202 for 30 kW FM Broadcast Service



The EIMAC CV-2202 is designed for use as the final amplifier of a 30 kW transmitter in the 86-108 MHz band assigned for FM broadcast service.

The amplifier tube used is the EIMAC 4CX20,000C high performance tetrode designed especially for VHF applications. The tube is grid driven for a stage gain of approximately 20 dB.

CHARACTERISTICS

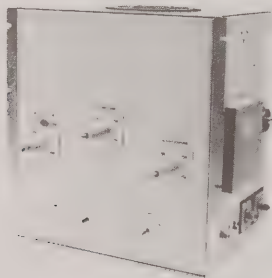
Tuning Range	86-108 MHz
Tube Type Used (not supplied)	4CX20,000C
Input rf connector	Type N
Output rf connector	3 1/8 Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in. Rack
Overall Dimensions (nominal):	
Height	31.5 in; 80.0 cm
Width	19 in; 48.3 cm
Depth	21 in; 53.3 cm
Net Weight, approx. (tube not installed)	60 lbs; 27.3 kg

TYPICAL OPERATION (95.5 MHz)

Filament Voltage	10.0 Vac
Filament Current	140 Aac
Anode Voltage	11.6 kVdc
Screen Voltage	600 Vdc
Grid Bias Voltage	-500 Vdc
Anode Current	3.85 Adc
Grid Current ¹	75 mAdc
Screen Current	200 mAdc
Driving Power ¹	249 W
Useful Power Output ^{1,2}	34.0 kW
Power Gain ¹	19.2 dB
Efficiency	76%

¹Approximate Value
²Power delivered to the load

CV-2228 for 10 kW FM Broadcast Service



The EIMAC CV-2228 is designed for use as the final amplifier of a 10 kW transmitter in the 86-108 MHz band assigned for FM broadcast service.

The amplifier tube used is the EIMAC 4CX7500A high performance tetrode designed especially for VHF applications. The tube is grid driven for a stage gain of approximately 20 dB. The high performance features of the 4CX7500A make possible a cavity design of exceptionally small size.

CHARACTERISTICS

Tuning Range	86-108 MHz
Tube Type Used (not supplied)	4CX7500A
Input rf connector	Type N
Output rf connector	1 5/8 in. Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in. Rack
Overall Dimensions (nominal):	
Height	19 in; 48.3 cm
Width	19 in; 48.3 cm
Depth	21 in; 53.3 cm
Net Weight, approx. (tube not installed)	48 lbs; 21.8 kg

TYPICAL OPERATION (98 MHz)

Filament Voltage	7.0 Vac
Filament Current	110 Aac
Anode Voltage	6.5 kVdc
Grid Bias Voltage	-275 Vdc
Anode Current	2.2 Adc
Grid Current ¹	90 mAdc
Driving Power ¹	99 W
Useful Power Output ^{1,2}	11.1 kW
Power Gain ¹	20.5 dB
Efficiency	72.2%

¹Approximate Value
²Power delivered to the load

CV-2225 for 5 kW FM Broadcast Service



The EIMAC CV-2225 is designed for use as the final amplifier of a 3 to 5 kW transmitter in the 86-108 MHz band assigned for FM broadcast service.

Cavity design is straightforward and relatively simple. The amplifier tube used is the EIMAC 4CX3500A high performance tetrode designed especially for VHF applications. The tube is grid driven for a stage gain of approximately 18 dB.

CHARACTERISTICS

Tuning Range	86-108 MHz
Tube Type Used (not supplied)	4CX3500A
Input rf connector	Type BNC
Output rf connector	1 5/8 in. Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in. Rack
Overall Dimensions (nominal):	
Height	19 in; 48.3 cm
Width	19 in; 48.3 cm
Depth	16 in; 40.6 cm
Net Weight, approx. (tube not installed)	34 lbs; 15.5 kg

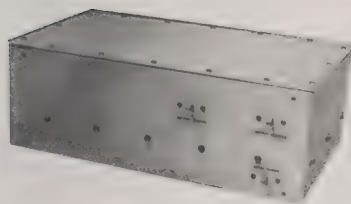
TYPICAL OPERATION (100.5 MHz)

Filament Voltage	5.0 Vac
Filament Current	90 Aac
Anode Voltage	4.3 kVdc
Grid Bias Voltage	-400 Vdc
Screen Grid Voltage	700 Vdc
Anode Current	1.9 Adc
Grid Current ¹	63 mAdc
Screen Current ¹	123 mAdc
Driving Power ¹	66 W
Useful Power Output ^{1,2}	5.53 kW
Power Gain ¹	19.0 dB
Efficiency	68%

¹Approximate Value

²Power delivered to the load

CV-2223 for 1.5 kW FM Broadcast Service



The EIMAC CV-2223 is designed for use as the final amplifier of a 1500-watt transmitter in the 86-108 MHz band assigned for FM broadcast service.

Cavity design is straightforward and relatively simple. The amplifier tubes used are two EIMAC 3CX800A7 high performance focused triodes. Low grid interception and high amplification factor make the drive requirements exceptionally low. The tube is cathode driven for a stage gain of 15 dB.

The CV-2223 is also recommended for use as an intermediate stage for driving high power tube-cavities.

CHARACTERISTICS

Tuning Range	86-108 MHz
Tube Type Used (not supplied)	Two 3CX800A7
Input rf connector	Type N
Output rf connector	7/8 in. Coaxial
Cooling Required	Forced Air
Mounting	Designed to fit 19-in Panel (not supplied)
Overall Dimensions (nominal):	
Height	6.125 in; 15.56 cm
Width	17.00 in; 43.18 cm
Depth	11.59 in; 29.44 cm
Net Weight, approx. (tube not installed)	7.3 lbs; 3.3 kg

TYPICAL OPERATION (100.5 MHz)

Heater Voltage	13.5 Vac
Heater Current (Approx.)	3.0 Aac
Anode Voltage	2.2 kVdc
Cathode Bias Voltage	+12 Vdc
Anode Current	1.1 Adc
Grid Current ¹	65 mAdc
Driving Power ¹	42 W
Useful Power Output ^{1,2}	1.5 kW
Power Gain ¹	15.5 dB
Efficiency	65%

¹Approximate Value

²Power delivered to the load

CV-2222 for 0.75 kW FM Broadcast Service



The EIMAC CV-2222 is designed for use as the final amplifier of a 750-watt transmitter in the 86-108 MHz band assigned for FM broadcast service.

Cavity design is straightforward and relatively simple. The amplifier tube used is the EIMAC 3CX800A7 high performance focused triode. Low grid interception and high amplification factor make the drive requirements exceptionally low. The tube is cathode driven for a stage gain of 15 dB.

CHARACTERISTICS

Tuning Range	86-108 MHz
Tube Type Used (not supplied)	3CX800A7
Input rf connector	Type BNC
Output rf connector	Type N
Cooling Required	Forced Air
Mounting	Designed to fit 19-in. Panel (not supplied)
Overall Dimensions (nominal):	
Height	6.125 in; 15.56 cm
Width	17.00 in; 43.18 cm
Depth	11.59 in; 29.44 cm
Net Weight, approx. (tube not installed)	7.3 lbs; 3.3 kg

TYPICAL OPERATION (107.9 MHz)

Heater Voltage	13.5 Vac
Heater Current (Approx.)	1.5 Aac
Anode Voltage	2.2 kVdc
Cathode Bias Voltage	+12 Vdc
Anode Current	0.5 Adc
Grid Current ¹	47 mAdc
Driving Power ¹	21 W
Useful Power Output ^{1,2}	.750 kW
Power Gain ¹	15.5 dB
Efficiency	68%

¹Approximate Value
²Power delivered to the load

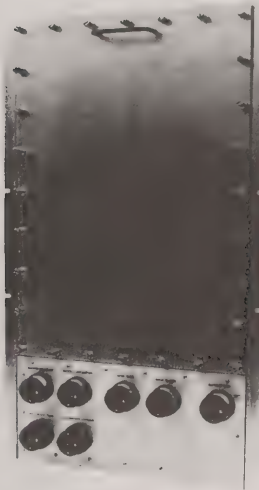
EIMAC TELEVISION BROADCAST CAVITY AMPLIFIERS

EIMAC television broadcast cavity amplifiers follow the general design technique used in the FM series of amplifiers with the exception that the former are broadbanded, having a bandpass characteristic suitable for the various television transmission standards in use today. The cavity

amplifiers use a grounded grid, high-mu focused triode for circuit simplicity and combine excellent linearity and high overall operating efficiency.

Consult with Varian EIMAC, San Carlos, CA for requirements or modifications of these designs for your special use.

CV-2240B VHF Low Band TV (CH2-CH6) 10kW Peak of Sync



The EIMAC CV-2240B cavity is designed for VHF low-band TV broadcast service. It is designed to utilize the EIMAC 3CX10,000U7 high-mu triode power amplifier tube. The tube and cavity combination is capable of delivering up to 10 kW peak-of-sync in video service, with typical power gain of 14 dB. In translator service the cavity can be operated at 2.5 kW peak-of-sync output with intermodulation distortion products of -52 dB or better.

The cavity can be easily mounted in a standard 19-inch rack. Counter dials are used on all tuning controls to simplify pretuning on the desired channel. Excellent linearity and efficiency make this tube and cavity combination a good choice for low-band television broadcast service.

CHARACTERISTICS

Tuning Range	54-88 MHz
Tube Type Used (not supplied)	3CX10,000U7
Input rf connector	Type N
Output rf connector	1½ in. Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in Rack
Overall Dimensions (nominal):	
Height	32 in; 81.3 cm
Width	19 in; 48.3 cm
Depth	19 in; 48.3 cm
Net Weight, approx. (tube not installed)	55 lbs; 25 kg

TYPICAL OPERATION (79 MHz)

Heater Voltage	15.0 Vac
Heater Current (Approx.)	13.5 Aac
Anode Voltage	5.5 kVdc
Grid Bias Voltage	-29.0 Vdc
Anode Current	3.6 Adc
Grid Current ¹	39 mAdc
Drive Power ¹	389 W
Useful Output Power ^{1,2} (peak of sync)	10 kW
Power Gain ¹	14.1 dB
Efficiency	50.5 %
Bandwidth (-1 dB points)	7 MHz

¹ Approximate Value

² Power delivered to the load

CV-2250B VHF High Band TV (CH7-CH13) (CH7-CH-E European) 10 kW Peak of Sync



The EIMAC CV-2250B cavity is designed for VHF high-band TV broadcast service. It is designed to utilize the EIMAC 3CX10,000U7 high-mu triode power amplifier tube. The tube and cavity combination is capable of delivering up to 10 kW peak-of-sync in video service, with typical power gain of 12-15 dB. In translator service the cavity can be operated at 2.5 kW peak-of-sync output with intermodulation distortion products of -52 dB or better.

The cavity is designed to be mounted behind a standard 19-inch panel. Operating frequency range is CH-7 through CH-13 Domestic, and CH-7 through CH-E European. Excellent linearity and efficiency make this tube and cavity combination a good choice for high-band television broadcast service.

CHARACTERISTICS

Tuning Range	177-228 MHz
Tube Type Used (not supplied)	3CX10,000U7
Input rf connector	Type N
Output rf connector	1½ in. Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in Rack
Overall Dimensions (nominal):	
Height	41.75 in; 106.05 cm
Width	15.50 in; 39.37 cm
Depth	12.25 in; 31.12 cm
Net Weight, approx. (tube not installed)	80 lbs; 36.3 kg

TYPICAL OPERATION (177 MHz)

Heater Voltage	15.0 Vac
Heater Current (Approx.)	13 Aac
Anode Voltage	5.5 kVdc
Grid Bias Voltage	-31.0 Vdc
Anode Current	3.5 Adc
Grid Current ¹	87 mAdc
Driving Power ¹	335 W
Useful Output Power ^{1,2,3}	10.55 kW
Power Gain ¹	15 dB
Efficiency	54 %
Bandwidth (-1 dB points)	6.28 MHz

¹ Approximate Value

² Power delivered to the load

³ Peak-of-sync

EIMAC UHF CAVITY AMPLIFIERS

EIMAC UHF cavity amplifiers cover the range of 180 to 970 MHz. They are useful for communication service in the CW, FM, SSB or pulsed mode. The designs incorporate an EIMAC high- μ focus triode in a cathode driven configuration, eliminating many of the circuit complications associated with UHF tetrode cavities, and providing comparable stage gain.

Several versions of the cavities are available for pulse operation. Consult Varian Power Grid & X-ray Tube Products, San Carlos, CA for your requirements or modifications of these designs for your special use.

CV-2401 400W Power Output, 390–450 MHz



The EIMAC CV-2401 is designed for use in the 390-450 MHz frequency range. It is designed for FM, CW or SSB linear amplifier service.

The amplifier tube is the EIMAC 3CX800A7, a high μ triode designed with beam-forming cathode and control grid geometry. The tube is cathode driven for good linearity and high stage gain. The triode design eliminates many of the cavity and equipment design complications associated with tetrode cavities.

For pulse service, the EIMAC 3CPX800A7 (pulse version of the 3CX800A7) should be used.

Similar cavities available for other frequency ranges, as follows:

CV-2407	188-200 MHz
CV-2403	280-300 MHz
CV-2405	330-370 MHz
CV-2402	375-420 MHz
CV-2406	450-470 MHz
CV-2404	470-530 MHz
CV-2408	585-615 MHz

Similar cavities are under development and can be adapted to your specific requirements.

CHARACTERISTICS

Tuning Range	390-450 MHz
Tube Type Used (not supplied)	3CX800A7
Input rf connector	Type N
Output rf connector	Type N
Anode connector	Type ACC-1
Cooling Required	Forced Air
Mounting Position	

Optional: normally mounts to fit 19-in Rack Panel

Overall Dimensions (nominal):

Height	5.0 in; 12.7 cm
Width	8.5 in; 21.6 cm
Depth	8.25 in; 20.9 cm
Net Weight, approx. (tube not installed)	13 lbs; 6.0 kg

TYPICAL OPERATION (450 MHz)

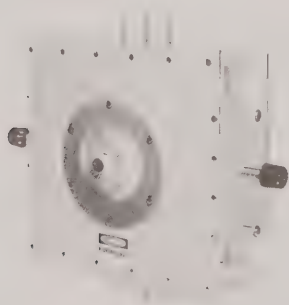
	CW or FM	CW/SSB ³
Heater Voltage	13.5	13.5 Vac
Heater Current	1.5	1.5 Aac
Anode Voltage	1.7	2200 kVdc
Cathode Bias Voltage	8.2	8.2 Vdc
Anode Current	0.5	0.5 Adc
Grid Current ¹	25	15 mAdc
Driving Power ¹	30	30 W
Useful Power Output ^{1,2}	425	520 W
Power Gain ¹	11.5	11.7 dB
Efficiency	56	57 %

¹Approximate Value

²Power delivered to the load

³Duty cycle less than 50%

CV-2400/CV-2400P 300W(1250W pulse) Power Output, 420–470 MHz



The EIMAC CV-2400 is designed for use in the 420–470 MHz frequency range. It is designed for FM, CW or SSB linear amplifier service.

The amplifier tube is the EIMAC 3CX400A7/8874, a high- μ triode designed with beam-forming cathode and control grid geometry. The tube is cathode driven for good linearity and a stage gain of approximately 13 dB. The triode design eliminates many of the cavity and equipment design complications associated with tetrode cavities.

The CV-2400P is intended for pulsed amplifier service and uses the EIMAC Y-805, which is a specially processed 3CX400A7/8874.

CHARACTERISTICS

Tuning Range	420-470 MHz
Tube Type Used (not supplied)	3CX400A7/8874
Input rf connector	Type N
Output rf connector	Type N
Anode connector	Type ACC-1
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	

Height	5.0 in; 12.7 cm
Width	8.5 in; 21.6 cm
Depth	8.25 in; 20.9 cm
Net Weight, approx. (tube not installed)	13 lbs; 6.0 kg

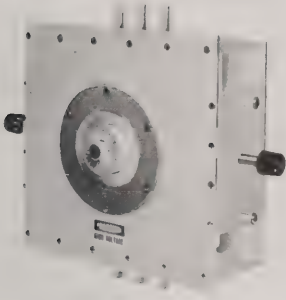
TYPICAL OPERATION (450 MHz)

	CV-2400 CW or FM	CV-2400P Pulsed
Heater Voltage	5.0	6.3 Vac
Heater Current (Approx.)	2.8	3.0 Aac
Anode Voltage	1.5	2.5 kVdc
Grid Bias Voltage	-2.0	-15 Vdc
Anode Current	0.4	1.25 Adc
Grid Current ¹	-7.0	10 mAdc
Driving Power ¹	15	125 W
Useful Output Power ^{1,2}	300	1250 W
Power Gain ¹	13	10 dB
Efficiency	50	40 %
Bandwidth (3 dB points)	4	4 MHz

¹ Approximate Value

² Power delivered to the load

CV-400-1 300W Power Output, 406-420 MHz



The EIMAC 406-420 MHz CV-400-1 is designed for use in the 400-420 MHz frequency range. It is designed for FM, CW or SSB linear amplifier service.

The amplifier tube is the EIMAC 3CX400A7/8874, a high-mu triode designed with beam-forming cathode and control grid geometry. The tube is cathode driven for good linearity and high stage gain. The triode design eliminates many of the cavity and equipment design complications associated with tetrode cavities.

Similar cavities available for other frequency ranges, as follows:

CV-400-3	450-470 MHz
CV-400-4	470-494 MHz
CV-400-5	494-512 MHz

CHARACTERISTICS

Tuning Range	405-421 MHz
Tube Type Used (not supplied)	8874/3CX400A7
Input rf connector	Type N
Output rf connector	Type N
Cooling Required	Forced Air
Mounting Position	

Optional: normally mounts to fit 19-in Rack Panel

Overall Dimensions (nominal):

Height	5.5 in; 13.9 cm
Width	8.6 in; 21.8 cm
Depth	11.2 in; 28.5 cm
Net Weight, approx. (tube not installed)	13 lbs; 6.0 kg

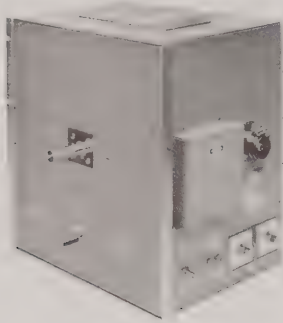
TYPICAL OPERATION

Heater Voltage	6.3 Vac
Heater Current	3.0 Aac
Anode Voltage	1.5 kVdc
Grid Bias Voltage	-3 Vdc
Anode Current	0.4 Adc
Grid Current ¹	10 mAdc
Driving Power ¹	20W
Useful Power Output ^{1,2}	300W
Power Gain ¹	11.7 db
Efficiency	50 %

¹ Approximate Value

² Power delivered to the load

CV-2226 5 kW Power Output, 45–55 MHz



The EIMAC CV-2226 cavity amplifier is designed for use as the main component of a high gain power amplifier covering the 45 to 55 MHz frequency range.

Cavity design is straightforward and relatively simple. The EIMAC 4CX3500A high performance VHF tetrode is grid driven for a stage gain of approximately 19 dB with a useful power output of over 5500 watts.

CHARACTERISTICS

Operating Range	45-55 MHz
Tube Type Used (not supplied)	4CX3500A
Input rf connector	Type BNC
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in. Rack
Overall Dimensions (nominal):	
Height	19.0 in; 48.3 cm
Width	19.0 in; 48.3 cm
Depth	21.0 in; 53.3 cm
Net Weight, approx. (tube not installed)	38 lbs; 17.3 kg

TYPICAL OPERATION

Filament Voltage	5.0 Vac
Filament Current	90 Aac
Anode Voltage	4.3 kVdc
Grid Bias Voltage	-400 Vdc
Anode Current	1.9 Adc
Grid Current ¹	63 mAac
Driving Power ¹	66 W
Useful Power Output ^{1,2}	5530 W
Power Gain ¹	19.2 dB
Efficiency	68%

¹Approximate Value

²Power delivered to the load

CV-2251A 10 kW Power Output, 140–165 MHz



The EIMAC CV-2251A covers the range of 140–165 MHz. It is designed for use as a linear AM amplifier at 10 kW PEP output.

Cavity design is straightforward and simple. The EIMAC 3CX10,000U7 high performance triode is cathode driven for a stage gain of 15 dB in linear AM service.

CHARACTERISTICS

Tuning Range	140-165 MHz
Tube Type Used (not supplied)	3CX10,000U7
Input rf connector	Type N
Output rf connector	1½ in. Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in Rack
Overall Dimensions (nominal):	
Height	37.0 in; 94.0 cm
Width	12.25 in; 31.1 cm
Depth	12.50 in; 31.8 cm
Net Weight, approx. (tube not installed)	56.25 lbs; 25.8 kg

TYPICAL OPERATION (140 MHz), AM Linear

	Carrier Level	100% Modulated
Heater Voltage	15.0	15.0
Heater Current	13.5	13.5
Anode Voltage	5.8	5.8
Grid Bias Voltage	-34	-34
Anode Current	1.5	3.3 Adc
Grid Current ¹	12	153
Driving Power ¹	78	230
Useful Power Output ^{1,2}	2.5	10
Power Gain ¹	15	15
Bandwidth (3 dB)	4	4

¹ Approximate Value

² Power delivered to the load

CV-2251B 40 kW Pulse Power Output, 140–165 MHz



The EIMAC CV-2251B covers the range of 140–165 MHz. It is designed for use as a pulsed RF amplifier at up to 40 kW peak output.

CHARACTERISTICS

Tuning Range	140–165 MHz
Tube Type Used (not supplied)	3CX10,000U7
Input rf connector	Type N
Output rf connector	1½ in. Coaxial
Cooling Required	Forced Air
Mounting	Vertical: Designed to fit 19-in Rack
Overall Dimensions (nominal):	
Height	37.0 in; 94.0 cm
Width	12.25 in; 31.1 cm
Depth	12.50 in; 31.8 cm
Net Weight, approx. (tube not installed)	56.25 lbs; 25.8 kg

TYPICAL OPERATION (155 MHz), Pulsed RF Amplifier

	Pulsed RF Drive*
Heater Voltage	15.0 Vac
Heater Current	13.5 Aac
Anode Voltage	7.2 kVdc
Grid Bias Voltage	–54 Vdc
Anode Current	500 mAcd†
Grid Current ¹	21 mAcd†
Driving Power ¹	1582 W†
Useful Power Output ^{1,2}	40 kW‡
Power Gain ¹	14 dB
Bandwidth (3 dB)	4 MHz

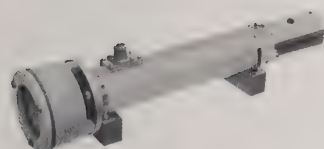
* Pulse Duration = 10 μs

PRF = 1000 pps

† Average current

‡ Peak power

CV-8020



The EIMAC CV-8020 coaxial cavity amplifier is specially designed for high efficiency, linearity, and highly reliable ground TACAN operation. In grounded-grid operation with cathode drive, the EIMAC CV-8020 can deliver up to 8 kW peak power.

Contact the Varian Power Grid & X-Ray Tube Products Salt Lake City facility for information and delivery of the CV-8020 and the Y-739F.

CHARACTERISTICS

Tuning Range	960–1215 MHz
Tube Type Used (supplied)	Y-739F
Input RF Connector	Type SMA Female
Output RF Connector	Type N Female
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	17.50 in; 44.45 cm
Diameter	3.94 in; 10.01 cm
Net Weight, approx. (tube not installed)	6.6 lbs; 3.0 kg

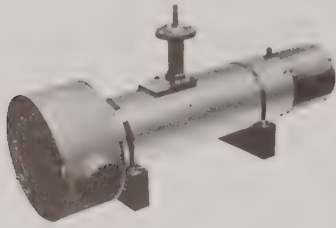
TYPICAL OPERATION (960–1215 MHz)

Heater Voltage	6.3 Vac
Heater Current (approx.)	2.25 Aac
Anode Voltage	5.0 kVdc
Grid Bias Voltage	–100 Vdc
Anode Current, peak	3 Adc
Driving Power ¹	225 W
Useful Output Power, peak ^{1,2}	4.5 kW
Power Gain ¹	13 dB
Efficiency	30%
Bandwidth (3 dB points)	20 MHz

¹Approximate value

²Power delivered to the load

CV-8028, CV-8029, CV-8046



These EIMAC coaxial cavity oscillators are specially designed for high power, high efficiency and highly reliable ECM-type service. In grounded cathode operation with grid modulation, the EIMAC oscillators can deliver up to 50 kW peak power, depending on the pulse duration and duty desired.

Contact the Varian Power Grid & X-Ray Tube Products Salt Lake Facility for information and delivery on the cavity oscillator and the Y-793.

CHARACTERISTICS

Tuning Range:	
(CV-8028)	700-850 MHz
(CV-8029)	500-600 MHz
(CV-8046)	600-700 MHz
Tube Type Used (supplied)	Y-793
Output rf connector	7/8 in. EIA Coaxial
Cooling Required	Forced Air
Mounting Position	Any
Overall Dimensions (nominal):	
Length	20.4 in; 51.82 cm
Diameter	6.5 in; 16.51 cm
Net Weight, approx. (tube not installed)	22 lbs; 10 kg

TYPICAL OPERATION (800 MHz)

Heater Voltage	5.5 Vac
Heater Current, approx.	12 Aac
Anode Voltage	5.5 kVdc
Grid Bias Voltage	-150 Vdc
Anode Current, peak	28 Adc
Useful Output Power ^{1,2,3}	50 kW
Efficiency	32 %

¹ Approximate Value

² Power delivered to the load

³ Peak pulse power

ADDITIONAL PULSED CAVITY OSCILLATORS AND AMPLIFIERS

(Contact Varian Power Grid & X-Ray Tube Products, Salt Lake City, UT for availability)

Cavity Model	Type	Frequency (GHz)	Anode Voltage (kV)	Power Output (W)	Dimensions (cm)		Connectors		Tube Type
					Length	Diam.	Output	Input	
CV-8013*	OSC.	1.6± .02	6.0	20,000	15.0	7.4	HN	—	Y-739F
CV-8030**	AMP.	1.215-1.300	7.0	12,000	44.4	11.4	N	SMA	Y-739F
CV-8031**	AMP.	0.42-0.35	7.0	12,000	39.0	11.4	N	SMA	Y-739F
CV-8032**	AMP.	0.162-0.173	7.0	12,000	39.0	11.4	N	SMA	Y-739F
CV-8037**	AMP.	0.1785	7.0	12,000	39.0	11.4	N	SMA	Y-739F

* Grid Pulsed, pulse duration = 10μs. Bias voltage = -150.

** Cathode Pulsed, pulse duration = 10μs. Bias voltage = -150.

CAVITY AMPLIFIERS

Cavity	Freq. Range (MHz)	Power (kW)	Tube
CV-2231	45-55	70†	4CX40,000G
CV-2232	45-55	100†	4CW100,000E
CV-2232A	45-55	125	4CW150,000E or Y567B
CV-2258A	212	15	4CX25,000A
CV-5202	267	3	2KDX15LA Klystrode
CV-5900	267	250	2KDW250PA Klystrode
CV-2411	405	40†	3CPX3500U7

† Pulse Power Output

These cavities are for special applications and are currently available. Performance data is subject to change.

EQUIVALENT LIST

This index lists tubes of other manufacturers for which EIMAC types are suggested as equivalents. The data sheet for the particular type should be consulted before replacement is attempted because of possible mechanical or electrical differences.

TUBE TYPE	EIMAC EQUIVALENT	TUBE TYPE	EIMAC EQUIPMENT	TUBE TYPE	EIMAC EQUIPMENT	TUBE TYPE	EIMAC EQUIPMENT
AC55	5CX5000A/8170	E3033	4CX10,000D/8171	RS2014CL	4CX5000A/8170	3861B	4X150A/7034
AR680	YU-102	E3069	3CX5000H3	RS2016	4CX5000A/8170	4CX250F	4CX250FG/8621
AX4-125A	4-125A/4D21	E900	250TH	RS2021	3CX40,000A5	4D21	4-125A/4D21
AX4-250A	4-250A/5D22	F450TH	450TH	RS2044CL	4CX5000A/8170	4F15R	4X150A/7034
AX9901	5867A	FV-100F	4CX1000A	RS2793	4CX5000A/8170	4F17R	4X150G/8172
AY3-65	4-65/8165	FK10-2	3CW20,000H3	RS2794	4CX10,000D/8171	4F20R	7609
BEL125	4-125A/4D21	FK10-2	3CW10,000H3	RS3010CJ	3CW10,000H3	4F21	4-125A/4D21
BEL250	4-250A/5D22	FK12-1	3CW15,000D3	RS301CL	3CX5000H3	4H/135M	4X150A/7034
BEL250CX	4CX250B/7203	FK12-1	3CW20,000H3	RS3026	3CW20,000H3	4H/136M	7609
BR1102	3CX15,000H3	FK12-1	3CW30,000H3	RS3026	3CW30,000H3	4H/160M	4CX250B/7203
BR1160	3CX500H3	FK15-2	3CW40,000H3	RS3026CJ	3CW20,000H3	4KC/160M	Y-808
BR1165	3CX5000H3	FK30-2	3CW45,000H3	RS3040CJ	3CX40,000H3	4S016-T	4-125A/4D21
BR1182	3CX15,000H3	FK30-2	3CW45,000H3	RS3040CL	3CX20,000H3	4S040T	4-250A/5D22
BR1196	3CX5000H3	FK5-1	3CW10,000H3	RS3060CJ	3CW45,000H3	4T10R	7289/3CX100A5
BR1608F	3CX20,000H3	FL10-2	3CX10,000H3	RS4791	4CX1000A/8168	4T16	100TL
BR1612F	3CX20,000H3	FL12-1	3CX10,000D3	RS630	100TH	4T17	100TH
BW1121	3CW40,000H3	FL15-2	3CX15,000H3	RS685	4-125A/4D21	4T25R	4X150G/8172
BW1122	3CW20,000H3	FL30-2	3CX20,000H3	RS686	4-250A/5D22	4X150D	7609
BW1124	3CW10,000H3	FL5-1	3CX5000H3	SRS360	5867A	4X250B	4CX250B/7203
BW1143	3CW40,000H3	FW-10-1	3CW10,000H3	SRS455	6155	5D22	4-250A/5D22
BW1162	3CW10,000H3	ML4-125A	4-125A/4D21	SRS456	6156	5F15R	4X150A/7034
BW1183	3CW45,000H3	ML4-250A	4-250A/5D22	T-1000-1	3-1000H	5F16R	7609
BW1196	3CW10,000H3	ML4-400A	4-400A/8438	T-1301	100TH	5F17R	4X150G/8172
CCS-1	Y-799	ML4-400A	4-400C/6775	T-150-1	250TH	5F20RA	4CX250B/7203
CQ10.3-1	4CX250B/7203	ML6423	4CX10,000H3	T-300-1	450TH	5F22	4-250A/5D22
CV1102	4-250A/5D22	ML6425	3CX10,000H3	T-380-1	3-400Z/8163	5F22A	6156
CV11106	5CX1500A	PE340	4E27A/5-125B	TBL6/14/804	3CX10,000H3	5F23	4-400A/8438
CV11107	4CX35,000C/8349	PL172	8295A	TBL12/38	3CX15,000H3	5F23	4-400C/6775
CV1350	5867A	PL175A	4-400A/8438	TBW12/38	3CW30,000H3	5F23A	4-400B/7527
CV1905	4-65A/8165	PL175A	4-400C/6775	TB3/350	100TH	5F25R	4CX250FG/8621
CV2130	6155	PL177WA	177WA*	TB3/750	5867A	5F35R	4CX350A/8321
CV2131	6156	PL290A	290A	TB4/800	250TH	5I20	250TL
CV2159	4X150A/7034	PL4D21	4-125A/4D21	TD1/100A	7289/3CX100A5	5I21	250TH
CV2416	4PR60C/8252W	QB14/800	4X500A	TH328	Y-730	5I30	450TL
CV2487	4CX250B/7203	QB3.5/750	6156	TH338	Y-831	5I31	450TH
CV2516	7289/3CX100A5	QB3.5/750G	4-250A/5D22	TH347	Y-834	5I34	304TL
CV2519	4X150A/7034	QB3.5/750GA	4-250A/5D22	TH350	3CX15,000H3	5I35	304TH
CV2572	450TH	QB3.200	4-65A/8165	TH351	3CX15,000H3	6F50R	4X500A
CV2589	250TH	QB3/300	6155	TH351	3CX20,000H3	6F50RA	4X500A
CV2611	304TH	QB3/300GA	4-125A/4D21	TH352	3CX20,000H3	6I51	3-1000H
CV2752	4PR60C/8252W	QB4/1100GA	4-400A/8438	TH4327	4E27A/5-125B	6422	3CW20,000H3
CV2963	4-125A/4D21	QB4/1100GA	4-400C/6775	TH486	3CW20,000H3	6423	3CX10,000H3
CV2964	4-250A/5D22	QB4/250B	4-250A/5D22	TH752	3CW45,000H3	6424	3CW20,000H3
CV3879	4-400A/8348	QEL1/150	4X150A/7034	TH756	3CW40,000H3	6425	3CX10,000H3
CV3879	4-400C/6775	QEL1/150H	7609	TI16	4-125A/4D21	6569	5867A
CV3880	4-100A/8166	QEL2/200	4CX250R/7580W	TI16D	6155	7F25	4-1000A/8166
CV3893	4X150G/8172	QEL2.275	4CX250B/7203	WL5D22	4-250A/5D22	7F25A	4-1000A/8166
CV3991	7609	QEL2/275H	4CX250FG/8621	X103	6155	7T10R	3CX3000A7
CV427	4PR60C/8252W	QV1-150	4X150A/7034	X424D	4X150A/7034	7T69RB	3CX5000H3
CV5176	2-01C*	QV1-150A	4CX250B/7203	X651Z	8930	7092	3-1000H
CV5430	7289/3CX100A5	QV1-150D	7609	YD1042	Y-579	7525	4-1000A/8166
CV5959	4-400B/7527	QV1-150G	4X150G/8172	YD1130	3-500Z	7804/TBL6/14	3CX10,000H3
CV6122	4-65A/8165	QV2-250B	4CX250B/7203	YD1130	3-400Z/8163	7806	3CX15,000H3
CV6131	4PR60C/8252W	QV2-250C	4CX250B/7203	YD1160/8731	3CX5000H3	7807	3CX30,000H3
CV6137	4CX250B/7203	QV20-P18	4PR60C/8252W	YD1170/8666	3CX10,000H3	8F10R	4CX5000A/8170
CV6184	4CX10,000D/8171	QV20-P18B	4PR60C/8252W	YD1172/8733	3CW10,000H3	8F11R	4CX10,000D/8171
CV789	3C24*	QY-250B	4-250A/5D22	YD1177/8956	3CW20,000H3	8F45R	4CX5000R/8170W
CV824	4-125A/4D21	QY3-125	6155	YD1180/8801	3CX15,000H3	8F76R	Y863
CV8295	4CX5000A	QY3-125B	4-125A/4D21	YD1182/8735	3CW40,000H3	8T20RA/B	3CX5000H3
CV8698	4CX350A/8321	QY3-65A	4-65A/8165	YD1182/8735	3CW45,000H3	8T24	3CW20,000H3
CV8699	4CX10,000D/8171	QY4-250	6156	YD1195/8913	3CX20,000H3	8T24	3CW20,000H3
CV9875	7609	QY4-250B	4-250A/5D22	YD1197/8937	3CW45,000H3	8T24RA	3CX10,000H3
CV9918	4CX1000A/8168	QY4-400	4-400B/7527	YD1270	Y-579A	8T25RA	3CX15,000H3
C1108	6155	QY4-400B	4-400A/8438	YD1381	Y-732	8T60	3CW45,000H3
C1108	4-125A/4D21	QY4-400B	4-400C/6775	YL1170	4CX250R/7580W	8T72A	3CW40,000H3
C1112	4-250A/5D22	QY4-400VB	4-400A/8438	YL1340	4CX350A/8321	8T72B	3CX40,000H3
C1136	4-400A/8348	QY4-400VB	4-400C/6775	YL1341	4CX350F/8322	8T85B	3CX10,000H3
C1136	4-400C/6775	QY4-500A	4X500A	YL1461	4-400A/8438	8T85RB	3CX10,000H3
C1149	4PR60B	Q160-1	4-125A/4D21	YL1461	4-400C/6775	8T87RB	3CX20,000H3
C1149/1	4PR60C/8252W	Q400-1	4-400B/7527	152RA	2-150D*	8560A5	8560A
C1149B	4PR60C/8252W	Q450-1	4-400A/8438	2T24	3C24*	8597	Y-743
C1149B	4PR60C/8252W	Q450-1	4-400C/6775	3C200	250TH	8666/YD1170	3CX10,000H3
DR450TH	450TH	RD3026CL	3CX15,000H3	3F60P	4PR60C/8252W	8731/YD1160	3CX5000H3
DX361A	4CX350FJ/8904	RE125	4-125A/4D21	3F65	4-65A/8165	8733/YD1172	3CW10,000H3
DX393A	8930	RE400C	4-250A/5D22	3HC/151JYY	7289/3CX100A5	8735/YD1182	3CW40,000H3
DX553	4CX350A/8321	RK63	250TH	3H151J	7289/3CX100A5	8735/YD1182	3CW45,000H3
EL2/275H	4CX250FG/8621	RS1002A	4-250A/5D22	3S035T	5867A	8801/YD1180	3CX15,000H3
ES204A	5867A	RS1007	4-125A/4D21	3040	3CW40,000H3	8913/YD1195	3CX20,000H3
ET1000	250TH	RS1026	5867A	35R	2-50A*	8937/YD1197	3CW45,000H3
E152A	6155	RS1046	3-1000H	381	7289/3CX100A5	8956/YD1177	3CW20,000H3
E250A	6156	RS1061L	3CX5000H3				

*Types no longer manufactured by Varian

EQUIVALENT LIST

CROSS-REFERENCE - EIMAC TO EIA

2-01C*	3CX1500A7	8877	4CV50,000J	---	4CX5000R	8170W	6156	6156
2-50A*	3CX1500U7	8962	4CV100,000C	8351	4CX7500A	---	7211	7211
2-150D*	3CX2500A3	8161	4CV100,000CP	---	4CX10,000D	8171	7609	7609
2C39A	3CX2500F3	8251	4CV100,000E	---	4CX10,000J	---	7698	7698
2C398A	3CX2500H3	---	4CV100,000EP	---	4CX12,000A	8989	7815AL	7815AL
2C39WA	3CX3000A1	8238	4CV250,000B	---	4CX15,000A	8281	7815RAL	7815RAL
2C39WA	3CX3000A7	---	4CW800B	---	4CX15,000J	8910	7855	7855
2CX10,000F	3CX3000F1	8239	4CW800F	---	4CX15,000R	---	7855K	7855K
3C24*	3CX3000F7	8162	4CW2000A	8244	4CX20,000A	8990	7855KAL	7855KAL
3-200A3*	3CX5000A3	---	4CW10,000A	8661	4CX20,000B	---	8403	8403
3-400Z	3CX5000A7	---	4CW10,000B	---	4CX20,000C	---	8533	8533
3-500Z	3CX5000H3	---	4CW25,000A	---	4CX20,000D	9015	8533W	8533W
3-1000H	3CX5000U7	---	4CW25,000B	---	4CX25,000A	---	8538B	8538B
3-1000Z	3CX10,000A1	8158	4CW30,000A	---	4CX35,000C	8349	8560AS	8560AS
3CPN10A5	3CX10,000A3	8159	4CW50,000E	---	4CX35,000D	---	8745	8745
3CPX100A5	3CX10,000A7	8160	4CW50,000J	---	4CX40,000G	---	8755	8755
3CPX800A7	3CX10,000B7	---	4CW100,000D	---	4CX40,000GM	---	8757	8757
3CPX1500A7	3CX10,000H3	---	4CW100,000E	---	4PR60B	8252	8847A	8847A
3CPX3500U7	3CX10,000U7	---	4CW150,000E	---	4PR60C	8252W	8873	8873
3CPX5000A7	3CX12,000U7	---	4CW250,000B	---	4PR65A	8187	8874	8874
3CV30,000H3	3CX15,000A3	---	4CX250B	7203	4PR125A	8247	8875	8875
3CW2000A7	3CX15,000A7	---	4CX250BC	8957	4PR250C	8248	8906	8906
3CW5000A3	3CX15,000B7	---	4CX250B/M	---	4PR400A	8188	8906AL	8906AL
3CW5000A7	3CX15,000H3	---	4CX250BT	---	4PR1000A	8189	8907	8907
3CW5000F1	3CX15,000H3	---	4CX250FG	8621	4PR1000B	---	8907AL	8907AL
3CW5000F3	3CX20,000A3	---	4CX250K	8245	4X150A	7034	8930	8930
3CW5000F7	3CX20,000A7	---	4CX250M	8246	5-125B	4E27A	8933	8933
3CW500H3	3CX20,000H3	---	4CX250R	7580W	5-500A	---	8938	8938
3CW10,000H3	4-400A	8438	4CX300A	8167	5CX1500A	---	8940	8940
3CW20,000A3	4-400B	7527	4CX300Y	8561	5CX1500B	---	8941	8941
3CW20,000A7	4-400C	6775	4CX350A	8321	5CX3000A	8966	8942	8942
3CW20,000H3	4-500A	---	4CX350AC	---	6C21*	6C21	8944	8944
3CW20,000H7	4-500B	---	4CX350F	8322	172*	8295A	8954	8954
3CW30,000H3	4-1000A	8166	4CX350FJ	8904	177WA*	6549W	8959	8959
3CW30,000H7	4CM300,000G	9000	4CX600B	---	250R	---	8960	8960
3CW40,000A5	4CM400,000A	---	4CX600F	---	250TH	250TH	8972	8972
3CW40,000H3	4CM400,000AG	---	4CX600J	8809	250TL	250TL	8973	8973
3CW45,000H3	4CPL1000A	---	4CX600JA	8921	254W*	---	8974	8974
3CW150,000H3	4CPL1000B	---	4CX600JB	---	264	8576	8980	8980
3CX100A5	4CPL1000C	---	4CX1000A	8168	290A	---	9013	9013
3CX400A7	4CPW10,000R	9016	4CX1000K	8352	304TH	304TH	9015	9015
3CX400U7	4CPW300,000A	9008	4CX1500A	---	304TL	304TL	9016	9016
3CX600U7	4CPW1000KA	9009	4CX1500B	8660	450TH	450TH	9019	9019
3CX800A7	4CPW1000KB	---	4CX3000A	8169	450TL	450TL	---	---
3CX800U7	4CPX250K	8590	4CX3500A	---	826*	826	---	---
3CX100A3	4CS250R	---	4CX5000A	8170	5867A	5867A	---	---
3CX1000A7	4CV35,000A	---	4CX5000J	8909	6155	6155	---	---
3CX1200A7	4CV50,000E	---						

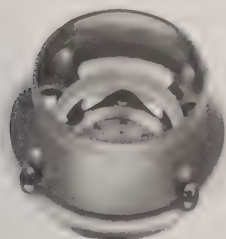
CROSS-REFERENCE - EIA TO EIMAC

2C39A	2C39A	7609	7609	8189	4PR1000A	8560AS	8560AS	8938	8938
2C398A	2C398A	7698	7698	8238	3CX3000A1	8561	4CX300Y	8940	8940
2C39WA	2C39WA	7815	3CPN10A5	8239	3CX3000F1	8576	264	8941	8941
3C24	3C24	7815AL	7815AL	8241	3CW5000F1	8590	4CPX250K	8942	8942
4D21	4-125A	7815R	3CPX100A5	8242	3CW5000A3	8596	8596	8944	8944
5D22	4-250A	7815RAL	7815RAL	8243	3CW5000F3	8621	4CX250FG	8954	8954
6C21*	6C21	7855	7855	8244	4CW2000A	8660	4CX1500B	8957	4CX250BC
250TH	250TH	7855K	7855K	8245	4CX250K	8661	4CW10,000A	8959	8959
250TL	250TL	7855KAL	7855KAL	8246	4CX250M	8745	8745	8960	8960
304TH	304TH	8158	3CX10,000A1	8247	4PR125A	8755	8755	8961	3CX400U7
304TL	304TL	8159	3CX10,000A3	8248	4PR250C	8757	8757	8964	8964
592*	3-200A3	8160	3CX10,000A7	8251	3CX2500F3	8809	4CX600J	8965	8965
826*	826	8161	3CX2500A3	8252	4PR60B	8847A	8847A	8966	5CX3000A
5867A	5867A	8162	3CX3000F7	8252W	4PR60C	8873	8873	8972	8972
6155	6155	8163	3-400Z	8281	4CX15,000A	8874	3CX400A7	8973	8973
6156	6156	8164	3-1000Z	8283	3CX1000A7	8875	8875	8974	8974
6549W*	177WA	8165	4-65A	8295A	172	8877	3CX1500A7	8980	8980
6775	4-400C	8166	4-1000A	8321	4CX350A	8904	4CX350FJ	8989	4CX12,000A
7034	4X150A	8167	4CX300A	8322	4CX350F	8906	8906	8990	4CX20,000A
7035	USE 7609	8168	4CX1000A	8349	4CX35,000C	8906AL	8906AL	9000	4CM300,000G
7203	4CX250B	8169	4CX3000A	8351	4CV100,000C	8906BAL	8906BAL	9008	4CPW300,000A
7204	USE 4CX250FG	8170	4CX5000A	8352	4CX1000K	8907	8907	9009	4CPW1000KA
7211	7211	8170W	4CX5000R	8403	8403	8909	4CX15,000J	9013	Y676A
7289	3CX100A5	8171	4CX10,000D	8438	4-400A	8921	4CX600JA	9015	4CX20,000D
7527	4-400B	8187	4PR65A	8533W	8533W	8930	8930	9016	4CPW10,000R
7580W	4CX250R	8188	4PR400A	8538B	8538B	8933	8933	9019	YC130

SOCKETS

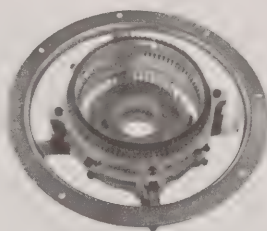
These sockets and accessories are specifically designed for use with EIMAC tubes. Choice of the proper socket insures longer tube life and better performance. All sockets incorporate low loss insulating materials. All metal parts are plated for corrosion protection. Tube contact surfaces are non-ferrous spring alloy, silver plated for good RF conductivity and heat treated for positive contact and long life. Open construction permits adequate air flow for tube cooling.

For special applications which require features different from these standard sockets, custom designed sockets are offered. These may be modifications of the standard sockets or completely new designs, manufactured to customer drawings or EIMAC design. Common modifications include contact spacing, mounting features, encapsulation of components, grounded contacts, bypass capacitors, insulating materials, contact materials, and plating.



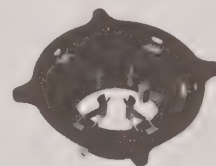
SK-184

SK-184A, SK-265A and SK-291A resemble SK-184 in general appearance



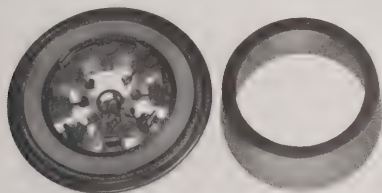
SK-300A

SK-300 and SK-310 resemble SK-300A in general appearance



SK-410

SK-510 resembles SK-410 in general appearance



SK-600A SK-606

SK-600, SK-602, SK-602A, SK-607, SK-610, SK-610A, SK-611 and SK-611A resemble SK-600A in general appearance

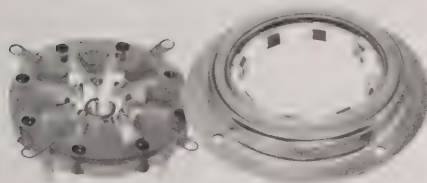


SK-620A SK-626 SK-636B

SK-630A resembles SK-620A in general appearance

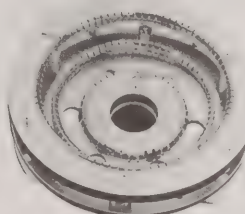


SK-640

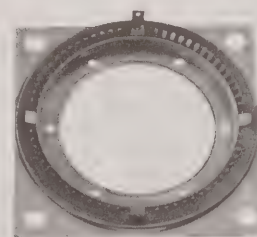


SK-650 SK-655

Socket and screen bypass units



SK 2500



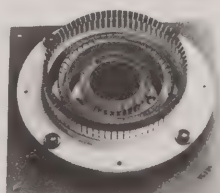
SK-680

Screen bypass unit

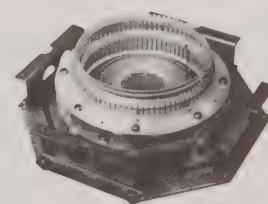


SK-700

SK-710 and SK-712A resemble SK-700 in general appearance



SK-375

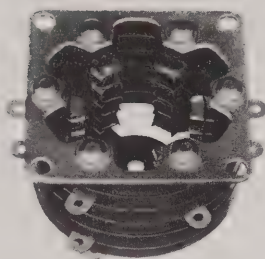


SK-350, SK-360

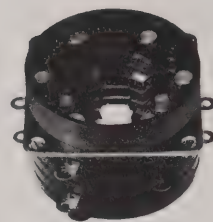
SOCKETS



SK-660A
Heat sink socket



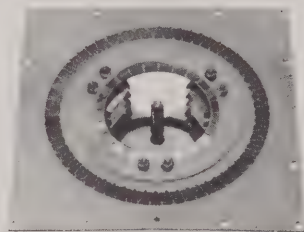
SK-740



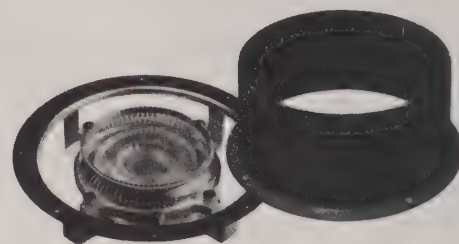
SK-760
SK-761 and SK-770 resemble SK-760



SK-800B SK-806
SK-810B and SK-890 resemble SK-800B



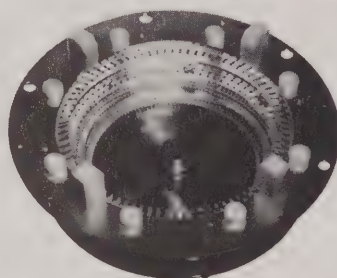
SK-820
SK-830A, SK-831, SK-840, and SK-860
resemble SK-820



SK-1300 SK-1306
SK-1310 and SK-1320 resemble SK-1300



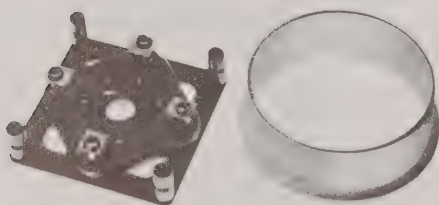
SK-1400A SK-1406
SK-1420, SK-1470A, and SK-1490
resemble SK-1400A



SK-1500A
SK-1510A resembles SK-1500A



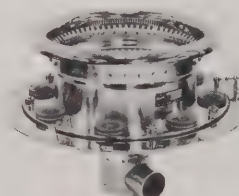
SK-2011A



SK-2200 SK-2216
SK-2210 resembles SK-2200



SK-2220



SK-2450

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

BYPASS CAPACITOR				FOR TUBE TYPE			
SOCKET NO.	CHIMNEY NO.		pF	DCWV	EIA #	CATALOG #	COMMENT
BR-101	Broiler Assembly		-	-	-	4CV8000A	Additional components are required for operation of a vapor-cooled tube. O-ring used is EIMAC P/N 124695
BR-200	Broiler Assembly		-	-	-	3CV30,000A1 3CV30,000H3 4CV35,000A	Additional components are required for operation of a vapor-cooled tube. O-Ring used is EIMAC P/N 119772.
BR-620	Broiler Assembly		-	-	-	4CV250,000B	Additional components are required for operation of a vapor-cooled tube. O-Ring used is EIMAC P/N 049172, supplied with the tube.
BR-710B	Broiler Assembly		-	-	-	4CV50,000E 4CV50,000J 4CV1000,000E	Additional components are required for operation of a vapor-cooled tube. Large O-Ring: EIMAC P/N 050625 packed w/tube. Small O-Ring: EIMAC P/N 049289
CB-203 A Control Box - controls boiler water level in vapor-cooled system; use dependent on system design.							
SK-184	C-184	g2 g3	2000 2500	1000 500	8295A	8295A	Air-system socket. C-184 chimney included.
SK-184A	C-184	g2	2000	1000	8295A	8295A	Air-System socket. C-184 chimney included. Suppressor grid grounded to shell.
Y510	C-184	g2	2000	1000	8295A	8295A	Mod. SK-184A: Mtg hole dia 0.165/0.155 Inch instead of standard 0.187/0.156 Inch.
SK-265A	C-265	g2	2000	1000	8576	264	Air-system socket. C-265 chimney included. Suppressor grid grounded to shell. Available for maintenance/repair: P/N 149842 Suppressor grid contact clip P/N 149807 Screen grid contract clip
SK-291A	C-291	g2	2000	1000	-	290A	Air-system socket. C-291 chimney included. Suppressor grid grounded to shell.
SK-300	SK-306 SK-306 SK-306 none req'd none req'd none req'd none req'd none req'd	- - - - - - - -	- - - - - - -	- - - - - - -	8170 8170W - - - - - 9016 -	4CX5000A 4CX5000R 4CX5000J 4CW10,000A 4CW10,000B 4CW25,000A 4CW25,000B 4CPW10,000R 4CW30,000A	Air-system socket. For replacement only - not for new designs. Chimney is molded fiberglass reinforced silicon resin. PARTSKIT-300 available for maintenance/repair. Also available: P/N 001837 Inner Fil. Collett 001838 Outer Fil. Collett 001839 Control Grid Collett 001840 Screen Grid Collett 149297 Screen Grid Collett Spring 015379 Post Insulator - 8 used 001813 Sleeve Insulator - 8 used
Y-291	same as SK-300	-	-	-	-	same as SK-300	Additional holes provided in inner and outer flanges. Filament insulated for 3000 volts.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR		FOR TUBE TYPE		COMMENT
		pF	DCWV	EIA #	CATALOG #	
Y-297A	same as SK-300	-	-	-	same as SK-300	Screen grid grounded to shell. No mounting ring. Only 13 contact fingers on control grid collet. Available for maintenance: P/N 115993 4-in. O.D. x 0.020 in. thick Teflon™ insulator (2 used per socket) 001837 Inner Fil. Collet 001838 Outer Fil. Collet 115983 Control Grid Collet 149241 Screen Grid Collet 149245 Screen Grid Collet Spring
Y-309	same as SK-300	g1 g2	200 4000	3000 3000	same as SK-300	Bypass capacitors added.
SK300A	SK-306	-	-	-	8170 4CX5000A	Improved air pressure drop characteristics.
	SK-306	-	-	-	8909 4CX5000J	Direct physical replacement for SK-300.
	SK-306	-	-	-	8170W 4CX5000R	For dc & LF/HF applications. For VHF
	SK-1306	-	-	-	8171 4CX10,000D	service the SK-360 is recommended.
	SK-1306	-	-	-	- 4CX10,000J	PARTSKIT-300 is available for
	SK-336	-	-	-	8989 4CX12,000A	maintenance/repair. Also available:
	SK-316	-	-	-	8281 4CX15,000A	P/N 001837 Inner Fil. Collet
	SK-316	-	-	-	8910 4CX15,000J	001838 Outer Fil. Collet
	SK-316	-	-	-	- 4CX15,000R	115738 Control Grid Collet
	SK-326	-	-	-	- 4CX25,000A	115740 Screen Grid Collet
	SK-316	-	-	-	9019 YC130	015380 Sleeve Insulator-4 used
	none req'd	-	-	-	8661 4CW10,000A	149297 Screen Grid Collet Spring
	none req'd	-	-	-	- 4CW10,000B	015379 Post Insulator-4 used
	none req'd	-	-	-	- 4CW25,000A	
	none req'd	-	-	-	- 4CW25,000B	
	none req'd	-	-	-	- 4CX30,000A	
	none req'd	-	-	-	9016 4CPW10,000R	
Y-597	same as SK-300A	-	-	-	same as SK-300A	Outline Drwg Dim. K held to ±0.015 in. from nominal instead of normal 0.695/0.600 in. Collets same as SK-300A.
Y-6328	same as SK-300A	-	-	-	same as SK-300A	Mod. SK-300A: rugged, larger mounting plate. Repair parts available: P/N 154694 Inner filament collet ass'y 154693 Outer filament collet ass'y 154692 Control grid collet ass'y 154688 Screen grid collet ass'y 154697 Screen grid collet spring 154686 Post insulator-4 used
Y-632C	same as SK-300A	-	-	-	same as SK-300A	Modified Y632B: further refinements. Repair parts available: P/N 154694 Inner filament collet ass'y 154693 Outer filament collet ass'y 154692 Control grid collet ass'y 154688 Screen grid collet ass'y 154697 Screen grid collet spring 154686 Post insulator-4 used

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

BYPASS CAPACITOR				FOR TUBE TYPE			
SOCKET NO.	CHIMNEY NO.		pF	DCWV	EIA #	CATALOG #	COMMENT
Y-632D	Dependent on tube	-	-	-	-	Special applications only	Water-cooled version. CONTACT EIMAC APPLICATION ENGINEERING BEFORE ATTEMPTED USAGE. Repair parts available: P/N 154740 Inner filament collet ass'y 154742 Outer filament collet ass'y 154692 Control grid collet ass'y 154688 Screen grid collet ass'y 154697 Screen grid collet spring 154686 Post insulator-4 used
Y-781	same as SK-300A	-	-	-	-	same as SK-300A	Teflon™ insulators and all metal parts are nickel plated. Same collets as SK-300A.
SK-310	none req'd	-	-	-	-	4CV35,000A	Cutouts in side eliminated; openings in cup base to allow for tube base cooling. Same collets as SK-300A.
SK-320	SK-326	-	-	-	8990	4CX20,000A	Air-system socket. Low air pressure drop characteristics. Collets & post/sleeve insulators are same as listed for SK-300A. For dc and LF/HF applications. For VHF applications the SK-360 is recommended.
	SK-326				-	4CX20,000B	
	SK-326				-	4CX20,000C	
	none avail				9015	4CX20,000D	
	SK-326				-	4CX25,000A	
SK-340	SK-306	-	-	-	-	4CX3500A	Air-system socket. For use in pulse, LF/HF and dc applications. Construction similar to SK-300A. For VHF applications use SK-350 socket. Same collets as SK-300A.
	SK-346				-	4CX7500A	
SK-350	SK-356	fil	15000	2500	-	4CX3500A	Air system socket. For VHF applications. Low inductance filament bypassing incorporated in the form of 3 each 5000 pF copper-clad Kapton™ capacitors. Includes provisions for mounting the SK-355 screen grid bypass kit. Repair parts for SK-350 available: P/N 001837 Inner filament collet ass'y 001838 Outer filament collet ass'y 001839 Control grid collet ass'y 001840 Screen grid collet ass'y 243113 Sleeve insulator - 8 used 154819 Post Insulator - 8 used 243131 Kapton™ bypass capacitor-3 used
	SK-346	(g2 use SK-355 bypass capacitor kit)				4CX7500A	
SK-355	Capacitor Kit	g2	8000	5000	-	-	Screen grid bypass capacitor kit for SK-350 and SK-360 sockets. Each kit includes the following: 8 each 1000 pF @ 5000 DCWV capacitor, P/N 050706 16 each Mounting bracket, P/N 720721 1 each Assembly Drawing, P/N 243135 20 Washer, #6 Br. Ni. Plate P/N 124350 20 Lockwasher, #6 split, Ph. Brnz Ni Plate P/N 124559 20 Screw, #6-32 x 1/4", Pan Hd Br Ni Plate P/N 511571

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

BYPASS CAPACITOR				FOR TUBE TYPE			
SOCKET NO.	CHIMNEY NO.		pF	DCWV	EIA #	CATALOG #	COMMENT
SK-360	SK-356	fil	15000	2500	8170	4CX5000A	Air-system socket. For VHF applications.
	SK-356	(g2 use SK-			8170W	4CX5000R	Low-inductance filament bypassing is in
	SK-356	355 bypass			-	4CX5000J	the form of 3 each 5000 pF copper clad
	SK-1306	capacitor			8171	4CX10,000D	Kapton™ capacitors. Provisions included
	SK-1306	kit)			-	4CX10,000J	for mounting the SK-355 screen grid by-pass
	none avail.				8989	4CX12,000A	capacitor kit. Repair parts available:
	SK-316				8281	4CX15,000A	P/N 001837 Inner filament collet ass'y
	SK-316				8910	4CX15,000J	001838 Outer filament collet ass'y
	SK-316				-	4CX15,000R	001839 Control grid collet ass'y
	SK-326				8990	4CX20,000A	001840 Screen grid collet ass'y
	SK-326				-	4CX20,000B	001813 Sleeve insulator-8 used
	SK-326				9015	4CX20,000C	243348 Post insulator-8 used
	none avail.				-	4CX20,000D	243131 Kapton™ bypass capacitor
	SK-326				-	4CX25,000A	
	SK-316				9019	YC130	Note: SK-360 is for grid-driven service.
	none req'd				8661	4CW10,000A	
	none req'd				-	4CW10,000B	Chimneys shown may be used with
	none req'd				-	4CW25,000A	proper mounting.
	none req'd				-	4CW25,000B	
	none req'd				-	4CW30,000A	
	none req'd				9016	4CPW10,000R	
SK-375	SK-356	-	-	-	8170	4CX5000A	Not an air-system socket. No bypass
	SK-356				8170W	4CX5000R	capacitors. Very low capacitance
	SK-356				-	4CX5000J	between filament and mounting surface.
	SK-1306				8171	4CX10,000D	Plastic support insulates the socket from
	SK-1306				-	4CX10,000J	ground. Intended for cathode driven
	SK-336				8989	4CX12,000A	service. Use of chimney in each case
	SK-316				8281	4CX15,000A	dependent on mounting arrangement.
	SK-316				8910	4CX15,000J	
	SK-316				-	4CX15,000R	Maintenance parts available:
	SK-326				8990	4CX20,000A	P/N 001837 Inner filament collet ass'y
	SK-326				-	4CX20,000B	001838 Outer filament collet ass'y
	SK-326				-	4CX20,000C	154868 Control grid collet ass'y
	SK-336				9015	4CX20,000D	154869 Screen grid collet ass'y
	SK-326				-	4CX25,000A	
	SK-316				9019	YC130	
	none req'd				8661	4CW10,000A	
	none req'd				-	4CW10,000B	
	none req'd				-	4CW25,000A	
	none req'd				-	4CW25,000B	
	none req'd				-	4CW30,000A	
	none req'd				9016	4CP10,000R	
SK-400	Discontinued socket type; no repair parts available. Equipment should be retrofitted with an SK-410.						

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR			FOR TUBE TYPE		COMMENT
		pF	DCWV	EIA #	CATALOG #		
SK-410	SK-406	-	-	-	4D21	4-125A	Air-system socket. Compact & light-weight. Made of thermo-setting plastic. Normally chassis sub-mounted. For tubes with or without a metal-shell reinforced base, EIA #A5-97 base. Available maintenance parts: P/N 15787 Base pin contact clip (5 used) 115846 Chimney/grounding clip (4 used) and supplied with socket.
	SK-406				4D21A	4D21A	
	SK-406				6155	6155	
	SK-406				8247	4PR125A	
	SK-406				5D22	4-250A	
	None avail				8248	4PR250C	
	SK-406				6156	6156	
	SK-406				5867A	5867A	
	SK-416				8163	3-400Z	
	SK-406				8438	4-400A	
	SK-406				8188	4PR400A	
	SK-406				7527	4-400B	
	SK-406				6775	4-400C	
	SK-406				-	3-500Z	
	SK-426				-	4-500A	
	SK-426				-	4-500B	
	none req'd				-	3CW1750	
	none req'd				-	3CW2000D3	
	SK-436				-	3CX1200A7	
none avail				-	3CX1500D3		
SK-446				-	3X750D7/YU-121		
SK-500	Discontinued socket type; no repair parts available. Equipment should be retrofitted with an SK-510.						
SK-510	SK-506	-	-	-	8166	4-1000A	Air system socket. Compact and light weight. Recommended for tubes with or without metal-shell reinforced base. Parts available: P/N 115788 Base pin contact clip (5 used) 115844 Chimney clip (4 used)
	SK-506				8189	4PR1000A	
	SK-506				8189W	4PR1000B	
	SK-506				8960	8960	
	SK-516				8164	3-1000Z	
	none req'd				-	3CW2500D3	
SK-520	SK-516				-	3-1000H	
	none avail	-	-	-	-	3CX1000A3	Available repair parts: P/N 171245 Pin connector
	none req'd				-	3CW1500A3	
none avail				-	3CX2500D3		
SK-600A	SK-606	g2	2700	1000	7034	4X150A	Air-system socket. Low-inductance cathode terminals insulated from shell. Chimney is high-alumina ceramic. Bypass capacitor is encapsulated for dust/moisture protection. Three (3) toe-clamps P/N 889901 supplied.
	SK-606				7609	7609	
	SK-606				7203	4CX250B	
	SK-606				8957	4CX250BC	
	SK-606				-	4CX250B/M	
	SK-606				-	4CX250BT	
	SK-606				8621	4CX250FG	
	SK-606				7580w	4CX250R	
	SK-646				8930	8930	
SK-612	same as SK-600A	g2	2700	1000	-	same as SK-600A	Modified SK-600A; brass insert to ground 4 cathode and 1 heater contact.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

BYPASS CAPACITOR					FOR TUBE TYPE		
SOCKET NO.	CHIMNEY NO.		pF	DCWV	EIA #	CATALOG #	COMMENT
SK-620A	SK-626 or SK-636B all types listed	g2	1100	1000	7034 7609 7203 8957 - 8621 7580W - 8321 - 8322 8904	4X150A 7609 4CX250B 4CX250BC 4CX250B/M 4CX250FG 4CX250R 4CX250BT 4CX350A 4CX350AC 4CX350F 4CX350FJ	Air-system socket. Low inductance cathode terminals insulated from shell. Bypass capacitor encapsulated for dust/moisture protection. SK-626 chimney is high alumina ceramic, held in position by gravity. The SK-636B includes an anode connector and clamp arrangement for positive retention of tube in any mounting position.
Y-268	same as SK-620A	g2	1500	1000	-	same as SK-620A	Physical appearance same as SK-620A. Includes modified bypass capacitor.
SK-630A	same as SK-620A	g2	1100	1000	-	same as SK-620A	Modified SK-620A; all 4 cathode terminals are connected to the shell. For use with standard SK-626 chimney or SK-636B clamping chimney.
SK-636B	Special chimney	-	-	-	-	Same as SK-620A	Molded thermosetting plastic; clamps socket to chassis and has anode clamping band made of beryllium copper. Designed to minimize relative motion between tube and socket in vibration or shock environment. Will retain tube when mounting is inverted.
SK-604	Same tubes as listed for SK-600A plus those listed here:				8590 8245	4CPX250K 4CX250K	Tube extractor. Made of stainless steel. For removing tube from recessed socket, such as a cavity installation, the two blades of the extractor are inserted through the cooling fins of the tube. Engage the lower edge of the cooler, and the tube may be pulled out.
SK-605	-	-	-	-	8961 - - - 8938 - - - 8245 8246 8590 8167 8561 8168 8352 8660	3CX400U7 3CX600U7 3CX800A7 3CX800U7 8938 - - 4CX250B/M 4CX250K 4CX250M 4CPX250K 4CX300A 4CX300Y 4CX1000A 4CX1000K 4CX1500B	Tube extractor, for use only with tubes which have a heliarced top tubulation cap. Made in the form of pliers, with coated handles and jaws which grip tube's tubulation cap. For pulling coaxial-base tubes from recessed sockets, or for tubes with breech-lock bases which must be turned and then removed from the socket.
SK-607	SK-646	g2	2700	1000	8809 8921	4CX600J 4CX600JA	Air system socket. No grounded terminals.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR		FOR TUBE TYPE		COMMENT
		pF	DCWV	EIA #	CATALOG #	
SK-610A	same as SK-600A	g2	2700	1000	same as SK-600A	Same as SK-600A except the 4 cathode terminals are grounded to the shell. Bypass capacitor is encapsulated for dust/moisture protection.
Y-358	Special chimney	-	-	-	same as SK-636B	Modified SK-636B; solder tabs on beryllium copper anode clamping ring are rotated 180°.
SK-640	Same as SK-600A	-	-	-	Same as SK-600A	Simplified design w/square mounting plate; no bypass capacitor; no grounded contacts.
SK-650	SK-626	-	-	-	Same as SK-620A	Light weight simplified socket; includes mounting flange. Use with SK-655 bypass capacitor assembly.
SK-655	Capacitor	g2	1100	1100	- 8961 - - 8874 8875	Bypass capacitor assembly for use with SK-650 for tetrode screen grid bypassing, or with listed triodes for grid bypassing. 3CX400U7 3CPX800A7 3CX800A7 3CX800U7 3CX400A7 8875
SK-660A	none req'd	-	-	-	- 8560AS	4CS250R 8560AS High alumina ceramic body. For use in heat-sink applications.
SK-700A	SK-606 SK-606				8167 8561	4CX300A 4CX300Y Air system socket. One heater terminal grounded to shell. Teflon™ body insulation. Capacitor is encapsulated.
SK-711A	SK-606 SK-606				8167 8561	4CX300A 4CX300Y Air system socket. Cath. & 1 heater terminal grounded to shell. Teflon™ body insulation. Capacitor is encapsulated.
SK-712A	same as SK-711A	g2	1100	400	-	same as SK-711A Same as SK-711A but only 1 heater terminal is grounded.
SK-740	none req'd none req'd	-	-	-	8167 8561	4CX300A 4CX300Y Light weight thermosetting plastic body. Not an air-system socket. For use in non-corrosive liquid cooling applications.
SK-760	integral integral	-	-	-	8167 8561	4CX300A 4CX300Y Similar to SK-740 but has an integral chimney.
SK-800B	SK-806 SK-806 none req'd	g2	1500	400	8168 8660	4CX1000A 4CX1500B Air system socket. No grounded contacts. Available parts for maintenance/repair: P/N 149062 Contact Finger 115923 Screen grid capacitor ass'y 889901 Toe clamps 115838 Mounting Base
Y-254A	same as SK-800B	-	-	-	-	same as SK-800B Modified SK-800B; no bypass capacitor; has integral chimney; square mounting base.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR		FOR TUBE TYPE			COMMENT
			pF	DCWV	EIA #	CATALOG #	
Y-387	same as SK-800B	-	-	-	-	same as SK-800B	Abbreviated version of SK-800B. Contains contact finger assemblies and base only. Has three 0.405 in. dia. holes in base.
Y-495	same as SK-800B	-	-	-	-	same as SK-800B	Modified Y149A: all element contacts are insulated from each other and from the frame.
SK-810B	same as SK-800B	g2	1500	400	-	same as SK-800B	Same as SK-800B except cathode and one heater contacts are grounded to shell. Available from Varian for maintenance/repair: P/N 149062 Contact Finger 115923 Screen grid capacitor ass'y 889901 Toe clamps
Y-770	same as SK-800B	g2	1500	400	-	same as SK-800B	Modified SK-810B: 2 control grid contact tabs removed to reduce circuit input capacitance.
SK-811	same as SK-800B	g2	5000	400	-	same as SK-800B	Same as SK-810B except g2 bypass capacitor is increased in value.
SK-820	SK-806	cath	500	400	8352	4CX1000K	Air-system socket. Screen grid grounded. Available from Varian for maintenance/repair: P/N 149062 Contact Finger 149070 Dielectric for bypass capacitor
Y-321A	see comment	cath g2	500 2500	400 1000	8352	4CX1000K	Both cathode and screen grid are bypassed. No provision for anode cooling air to pass through the mounting flange.
SK-830A	SK-806	g2	2500	1000	8352	4CX1000K	Air-system socket. Cathode grounded to shell. Available from Varian for maintenance/repair: P/N 149062 Contact Finger 149712 Bypass capacitor ass'y
SK-831	SK-806 SK-806	g2	2500	1000	8352 -	4CX1000K 4CX1500A	Air-system socket. Heavy filament leads. Same square mounting plate as SK-840. No tube elements are grounded. Available from Varian for maintenance/repair: P/N 149062 Contact Finger 149712 Bypass capacitor ass'y
SK-840	SK-806	g2	2500	1000	-	5CX1500A 5CX1500B	Air-system socket. Suppressor grid grounded. PARTSKIT-840 is available for user maintenance/repair. Also available: P/N 149068 Suppressor Grid Contact Ring 149541 Capacitor ass'y 149062 Base tab contact finger 149067 Retainer ring for 149068
Y-469	SK-806	g2	2500	1000	-	5CX1500A	Modified SK-840: has full complement of grid and heater contacts.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR			FOR TUBE TYPE		COMMENT
			pF	DCWV	EIA #	CATALOG #	
Y-509A	SK-806	g2	2500	1000	-	5CX1500A	Modified SK-840: 6 tapped holes between alternate air slots; special control grid connection; 1 filament connection; Kel-F™ spacer under screen grid connection.
SK-860	SK-816	-	-	-	8283	3CX1000A7	Air-system socket. No grounded terminals. Continuous ring contact to heater/cathode. Available from Varian for maintenance/repair: P/N 149062 Base tab Contact Finger.
SK-870	SK-816	-	-	-	8283	3CX1000A7	Modified SK-860: grid contacts grounded to shell. Available from Varian for maintenance/repair: P/N 149062 Base tab Contact Finger.
SK-890B	same as SK-800B	-	1500	400	-	same as SK-800B	Modified SK-800B: bypass capacitor isolated for use as required by equipment design. Capacitor rotated 60° to allow for addition of inductance. Available from Varian for maintenance/repair: P/N 149062 Contact Finger 115923 Bypass capacitor ass'y
SK-1000	none avail none avail none avail	-	-	-	-	Y-810 Y-811 Y-812	-
SK-1300	none req'd	-	-	-	-	3CW20,000A3	Air-system socket. No grounded contacts. PARTSKIT-1300 is available for user repair. In addition to other parts supplied in this kit, an inner filament collet is supplied. Also available for repair: P/N 001837 Inner filament collet ass'y 001838 Outer filament collet ass'y 115594 Grid collet ass'y 149297 Grid collet spring 115596 Post Insulator (4 used) 115595 Sleeve Insulator (4 used)
	none req'd				-	3CW20,000A7	
	none req'd				-	3CW30,000A7	
	none req'd				-	3CW40,000A5	
	SK-1316				-	3CX5000A3	
	SK-1306				8158	3CX10,000A1	
	SK-1306				8159	3CX10,000A3	
	SK-1306				8160	3CX10,000A7	
	SK-1306				-	3CX15,000A3	
	SK-1306				-	3CX15,000A7	
SK-1310	none req'd	-	-	-	-	3CV30,000A1	Modified SK-1300: no mounting flange; opening in cup base for cooling air path. PARTSKIT-1300 is available for user repair. Repair parts shown for SK-1300 applicable.
	none req'd					3CV30,000A3	
SK-1320	same as SK-1300	-	-	-	-	same as SK-1300	Air-system socket. Grid contacts grounded to shell. Repair parts shown for SK-1300 applicable except post insulator is P.N 154280.
SK-1360	none req'd	-	-	-	-	3CW45,000H3	Water jacket (same as SK-2050 except for P/N)

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR			FOR TUBE TYPE		COMMENT
			pF	DCWV	EIA #	CATALOG #	
SK-1400A	SK-1406	g2	1800	1000	8169	4CX3000A	Air-system socket. No contacts grounded. Available from EIMAC for maintenance/repair: P/N 149062 Contact finger (24 per socket) 115855 Bypass capacitor ass'y, which includes contact finger ring.
Y-330A	same as SK-1400A	-	-	-	-	same as SK-1400A	Modified SK-1400A: screen grid connected to frame. Low-inductance base contact arrangement. Improved airflow characteristics.
SK-1420	SK-1426	g2	1800	1000	8966	5CX3000A	Air-system socket. Suppressor grid grounded. Available from Varian for maintenance/repair: P/N 149062 Contact finger (14 per socket) 149530 Bypass capacitor ass'y
SK-1470A	SK-1406	-	-	-	8169	4CX3000A	Modified SK-1400A: screen contacts grounded. No bypass capacitor.
SK-1490	none req'd	-	-	-	-	4CV8000A	Modified SK-1400A: mounting flange removed. No bypass capacitor. No grounded contacts. Available from Varian for maintenance/repair: P/N 149062 Contact finger (24 per socket)

Note: BR-101 broiler required for anode cooling, plus associated accessories such as water lines, water level controller, condenser, water reservoir, etc.

SK-1500 Discontinued socket; no repair parts are available.

SK-1500A	none avail none req'd none req'd	-	-	-	8349	4CX35,000C	Not an air-system socket but includes attachment for tube stem cooling. Mounting flange common to screen grid contact ring. No tube seating device included. PARTSKIT-1500 is available for user repair. Available from Varian for maintenance/repair: P/N 149129 Inner filament collet ass'y 149130 Outer filament collet ass'y 149132 Control grid collet ass'y 149131 Screen grid collet ass'y
					8351	4CV1000,000C	
					-	4CW100,000D	
					-	Y-546	
					-	Y-647	

Note: Screen grid bypass capacitor components are available from EIMAC as follows:

P/N	149089	g2	2300	5000	-	-	Bypass capacitor dielectric (one supplied)
	149088	-	-	-	-	-	Set of insulator bushings (six supplied)
	149090	g2	1100	5000	-	-	Bypass capacitor dielectric (one supplied)
Y-336A	same as SK-1500A	-	-	-	-	Same as SK-1500A	Modified SK-1500A: low inductance control grid mounting ring; additional screen grid contact fingers on ring/mounting flange OD; SK-1511 seating device added.
Y 373A	same as SK-1500A	-	-	-	-	same as SK-1500A	Modified SK-1500A: Support insulators are redesigned; old style center guide post.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR			FOR TUBE TYPE		COMMENT
			pF	DCWV	EIA #	CATALOG #	
SK-1510A	same as SK-1500A	-	-	-	-	same as SK-1500A	Modified SK-1500A; tube seating device added. PARTSKIT-1500 is available for user repair. Repair parts same as shown for SK-1500A.
Y-384B	same as SK-1500A	g1 g2	6500 8000	3000 8000	-	same as SK-1510A	Modified SK-1510A; bypass capacitors added.
Y-384C	same as SK-1500A	g2	5300	6000	-	same as SK-1500A	Modified SK-1510; screen bypassing added.
Y-384D	same as SK-1500A	g2	7100	6000	-	same as SK-1500A	Modified SK-1510A; screen bypassing added.
Y-718	same as SK-1500A	-	-	-	-	same as SK-1500A	Modified SK-1510A; special mounting plate 6 ears added; altered base plate; stacking changed from basic unit.
SK-1511	Seating Device	-	-	-	-	-	Tube seating device for SK-1500A socket.
SK-1711	none req'd none req'd none req'd SK-2316 SK-2306 SK-2306	-	-	-	- - - 9008 9009 -	3CW250,000H3 4CV250,000B 4CW250,000B 4CPW300,000A 4CPW1000KA 4CPW1000KB	Filament connector - 2 required. SK-2306 and SK-2316 provide containment for protective gas atmosphere.
Note:	BR-620 boiler required for anode cooling with 4CV250,000B, plus associated accessories such as water lines, water level controller, condenser, water reservoir, etc.						
SK-1712	none req'd none req'd none req'd SK-2316 SK-2306 SK-2306	-	-	-	- - - 9008 9009 -	3CW250,000H3 4CV250,000B 4CW250,000B 4CPW300,000A 4CPW1000KA 4CPW1000KB	Grid connector - 1 required. SK-2316 and SK-2306 provide containment for protective gas atmosphere.
Note:	BR-620 boiler required for anode cooling with 4CV250,000B, plus associated accessories such as water lines, water level controller, condenser, water reservoir, etc.						
SK-1720	Water Jacket	-	-	-	-	4CW250,000B	Anode water jacket, not supplied with tube.
SK-1900	SK-1906 SK-1906 none req'd SK-606	-	-	-	- 8873 8874	3CX800A7 3CPX800A7 8873 3CX4000A7	For other than vertical mounting (anode up) of the 3CX800A7, chimney clamp SK-1916 should be used.
SK-1920	Thermal Link*	-	-	-	8873 8560AS	8873 8560AS	Beryllium-oxide ceramic thermal link, for combined electrical insulation and heat conduction from anode to heat sink.

* Before use read the Operating Hazards sheet.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

		BYPASS CAPACITOR		FOR TUBE TYPE			
SOCKET NO.	CHIMNEY NO.		pF	DCWV	EIA #	CATALOG #	COMMENT
SK-2011A	none req'd none req'd none req'd none req'd none req'd none req'd none req'd none req'd none req'd none req'd	g2	12800	4000	-	4CV50,000E 4CV50,000J 4CW50,000E 4CW50,000J 4CW100,000E - 4CW150,000E Y-567B Y-676 Y-676A	Preferred for radio-frequency applications. See SK-2020 and SK-2021. No grounded contacts. Maintenance parts available: P/N 154190 Inner Fil. Collet Ass'y s/studs 154197 Outer Fil. Collet Ass'y 149969 Control Grid Collet Ass'y 154396 Screen Grid Capacitor Ass'y 154322 Screen Grid Connector 154396 Capacitor Ass'y 154317 Kapton™ capacitor dielectric
YC100	none req'd	g2	1600	4000		same as 2011A	Modified SK-2011A - g2 bypass capacitance is reduced. Except for g2 capacitor maintenance parts are same as SK-2011A.
YC116	none req'd	-	-	-	-	Y-841	Mod. SK-2011A; no g2 contacts or capacitor. Other maintenance parts same as SK-2011A.
SK-2020	Corona Ring	-	-	-	-	same as SK-2011A	Corona ring which may be attached to the SK-2011A for improved high voltage holdoff.
SK-2021	Corona Ring	-	-	-	-	same as SK-2011A	Anode flange corona ring. Used in conjunction with the SK-2020.
SK-2050	Water Jacket	-	-	-	-	4CW50,000E 4CW50,000J	Water jacket, not supplied with tube but required; O-Ring: EIMAC P/N 050625. Water fitting 3/4" sleeve: P/N 051464 Water fitting plastic seal plug: P/N 051695 Cooler fitting nut (plated): P/N 016253.
SK-2100	Water Jacket	-	-	-	- 8959 - Y-676 - Y-676A	4CW1000,000E - Y-676 Y-676A	Water jacket <u>not</u> supplied with tube Water jacket <u>not</u> supplied with tube Water jacket <u>not</u> supplied with tube. Water jacket is supplied with tube.
SK-2110	Water Jacket	-	-	-	8959 - Y-676 - Y-676A	- Y-676 Y-676A	Modified SK-2100. External metal surface is silver plated. Spacing between water fittings increased by 0.045 inch.
SK-2200	SK-2216	-	-	-	8877 -	3CX1500A7 3CPX1500A7	Air-system socket. Chimney made of Teflon™. No grounded sockets. Available for repair: P/N 149809 Mounting base/support 048291 Base contact ass'y (complete) 149842 Grid contact clip (4 required)
SK-2210	SK-2216	-	-	-	8877 -	3CX1500A7 3CPX1500A7	Modified SK-2200; grid grounded to shell.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

SOCKET NO.	CHIMNEY NO.	BYPASS CAPACITOR			FOR TUBE TYPE		COMMENT
			pF	DCWV	EIA #	CATALOG #	
SK-2220	SK-2216	-	-	-	8938	8938	Air-system socket, for use up to 200 MHz. Grid grounded to shell. Collets also available separately to fit tube contact surfaces: P/N 135310 Heater (center pin) 135307 Heater 135306 Cathode 135305 Grid 135304 Anode
SK-2306	Hood	-	-	-	9009 -	4CPW1000KA 4CPW1000KB	Containment for protective gas atmosphere, required for operation at rated maximum voltage.
SK-2310	Connector	-	-	-	- 8972 8973 8974	4CM400,000A 4CM400,000G	Water-cooled filament connector; 2 required. 3 required. 2 required. 3 required.
SK-2315	Connector	-	-	-	- 8972 8973 8974	4CM400,000A 4CM400,000G	Low inductance connector for rf return, filament to ground; 2 required.
SK-2316	Hood	-	-	-	9008	4CPW300,000A	Containment for protective gas atmosphere, required for operation at rated max. voltage.
SK-2321	Fitting	-	-	-	8973 8974 8972 9009 -	4CPW1000KA 4CPW1000KB	Water fitting, anode cooling jacket. Corona shield & electrolytic target included. For direct connection to flexible canvas hose. Two SK-2321 required per tube.
SK-2322	Fitting	-	-	-	8972 8973 8974 9009 -	4CPW1000KA 4CPW1000KB	Water connection for anode cooling water. Intended for direct connection to 2" NPT fittings.
SK-2323	Fitting	-	-	-	8972 8973 8974 9009 -	4CPW1000KA 4CPW1000KB	Water connection for anode cooling water. Used with 1-5/8" ID hose held to the connector with hose clamps.
SK-2350	Collets	-	-	-	8172 8245	4X150G 4CX250K	Full set of contact collets: P/N 008290 Heater pin 008291 Heater/cathode 008292 Control grid 882931 Screen grid 008294 Anode
SK-2410	SK-2406 SK-2406 SK-2406 none req'd	g2 fil	9500 7000	4000 4000	- - -	4CX40,000G 4CX40,000GM	For VHF applications. Identical 7000 pF bypassing at each filament terminal.

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

SOCKETS, CHIMNEYS, & HARDWARE FOR EIMAC TUBES
INCLUDING Y-NUMBER VARIATIONS WHEN AVAILABLE

		BYPASS CAPACITOR			FOR TUBE TYPE		
SOCKET NO.	CHIMNEY NO.		pF	DCWV	EIA #	CATALOG #	COMMENT
SK-2450	none req'd	-	-	-	9000	4CM300,000G	Air-system socket
SK-2500	SK-356	-	-	-	-	3CX5000U7 3CPX3500U7 3CPX10,000U7	Air-system socket, for HF and VHF applications. Grounded-grid use optional, depending on the mounting. Collets are available as follows: P/N 720638 Heater 720637 Heater/Cathode 720636 Grid 720635 Anode

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

Y-NUMBER SOCKET LIST CROSS REFERENCE

Y-254A	SEE SK-800B	Y-333A	SEE SK-1500A	Y-510	SEE SK-184A	Y-770	SEE SK-810B
Y-268	SEE SK-620A	Y-336A	SEE SK-1500A	Y-558	SEE SK-2000	Y-781	SEE SK-300A
Y-291	SEE SK-300	Y-358	SEE SK-636B	Y-597	SEE SK-300A	Y-784	SEE SK-300
Y-297A	SEE SK-300	Y-379	SEE SK-500	Y-632B	SEE SK-300A	YC-100	SEE SK-2011A
Y-309	SEE SK-300	Y-387	SEE SK-800B	Y-632C	SEE SK-300A	YC-116	SEE SK-2011A
Y-321A	SEE SK-820	Y-495	SEE SK-800B	Y-632D	SEE SK-300A	YC-120	SEE SK-375
Y-330A	SEE SK-1400A	Y-509A	SEE SK-840	Y-718	SEE SK-1510A		

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

TUBES, SOCKETS AND PARTSKITS SUMMARY

The EIMAC PartsKits contain selected replacement parts for the SK-300, SK-300A and SK-320; SK-840; SK-1300, SK-1310 and SK-1320; SK-1500A and SK-1510A sockets. The PartsKits are intended for emergency repair of these sockets in the field. In some cases the repair can be accomplished without removing the socket from the equipment.

PartsKit-300

The following tube types use the SK-300, SK-300A, SK-320 or SK-360 socket and need PartsKit-300:

4CX30,000A	4CX12,000A/8989	4CX20,000B	4CW10,000B
4CX5000A/8170	4CX15,000A/8281	4CX20,000C	4CW25,000A
4CX5000J/8909	4CX15,000J/8910	4CX20,000D/9015	4CW25,000B
4CX5000R/8170W	4CX15,000R	4CX25,000A	
4CX10,000D/8171	YC130/9019	4CPW10,000R/9016	
4CX10,000J	4CX20,000A/8990	4CW10,000A/8661	

PartsKit-840

The following EIMAC tube uses the SK-840 and requires PartsKit-840: 5CX1500A 5CX1500B

PartsKit-1300

The following EIMAC tube types use the SK-1300, SK-1310 or the SK-1320 socket and require the PartsKit-1300:

3CX5000A3/8159	3CX10,000A7/8160	3CX20,000A7	3CW40,000A5
3CX10,000A1/8158	3CX15,000A3	3CW20,000A3	3CV30,000A1
3CX10,000A3/8159	3CX15,000A7	3CW20,000A7	3CV30,000A3
	3CX20,000A3	3CW30,000A7	

PartsKit-1500

The following EIMAC tubes use the SK-1500A or SK-1510A socket and require PartsKit-1500.

4CX35,000C/8349	Y-546
4CV100,000C/8351	Y-647
4CW100,000D	

The individual components of the PartsKits are as follows:

PartsKit-300

1 Bushing	154176
1 Screen Collet Spring	149297
2 Teflon® Insulator	001820
4 Post Insulator	015379
4 Sleeve Insulator	015380
1 Inner Fil. Collet	001837
1 Outer Fil. Collet	001838

PartsKit-840

8 Contact Finger	149062
2 Ceramic Cylinder	011637
6 Bushing	011639
1 Ceramic Spacer	115969
2 Ceramic Spacer	011920
3 Ceramic Spacer	011638
1 Metal Spacer	115513
2 Inner Insulator	149548
1 Suppressor Grid Contact Ring	149068

PartsKit-1300

1 Grid Collet Spring	149297
2 Teflon® Insulator	001820
4 Post Insulator	154280
4 Sleeve Insulator	115595
1 Inner Fil. Collet	001837
4 Post Insulator	115596

PartsKit-1500

6 Spacer	154550
4 Spacer	149288
3 Spacer	149291
2 Spacer	149292
3 Insulator Cap	149289
1 Spacer	149293
3 Insulator Assembly	149506

SOCKETS, CHIMNEYS AND HARDWARE FOR EIMAC TUBES

ANODE CONNECTOR CLIPS AVAILABLE FROM EIMAC

The ACC-1, ACC-2 and ACC-3 anode connector clips are intended for use with the tube types listed below. They are basically designed for making the high-voltage connection and not for carrying high rf current. They connect to the anode cap of the air-cooled tubes and may be clipped to one of the anode jacket pipes in the case of water-cooled tubes. They may be used with cavity assemblies when the anode connector is not used for the rf connection. An ACC-connector consists of a silver-plated spring clip, a solder lug, and a binderhead bolt with a washer, lock washer and a nut.

The ACC-1 Connector is intended for use with the following types:
(Terminal approximately 0.565 inch diameter)

3CPX800A7	3CW20,000H3	3CX800U7	4CX250BC/8957	4CX600J/8809
3CW5000A3/8242	3CW20,000H7	4CPL1000A	4CX250R/7580W	4CX600JA/8921
3CW5000A7	3CW30,000A7	4CPL1000B	4CX300A/8167	4CX600JB
3CW5000F1/8241	3CW30,000H3	4CPL1000C	4CX300Y/8561	4X500A
3CW5000F3/8243	3CW30,000H7	4CPW10,000R	4CX350A/8321	8295A/172
3CW5000F7	3CX400A7/8874	4CS250R	4CX350AC	8560AS
3CW5000H3	3CX400U7	4CW10,000A/8661	4CX350F/8322	8873
3CW10,000H3	3CX600U7	4CW10,000B	4CX350FJ/8904	8875
3CW20,000A3	3CX800A7	4CX250B/7203	4CX600F	Y-808/4KC/160M
3CW20,000A7				

The ACC-2 Connector is intended for use with the following types:
(Terminal approximately 0.815 inch diameter)

3CPX1500A7	3CX2500H3	3CX4500H3	4CX3000A	8938
3CX1000A7/8283	3CX3000A1/8238	4CX1000A/8168	5CX1500A	
3CX1500A7/8877	3CX3000A7	4CX1500A	5CX1500B	
3CX2500A3/8161	3CX3000F1/8239	4CX1500B/8660	264/8576	
3CX2500F3/8251	3CX3000F7/8162	4CX1500BC	290A	

The ACC-3 Connector is intended for use with the following types:
(Terminal approximately 0.875 inch diameter)

2CX10,000F	3CX10,000A7/8160	3CX20,000A7	4CX10,000D/8171	4CX20,000C
3CPX3500U7	3CX10,000B7	3CX20,000B5	4CX10,000J	4CX20,000D/9015
3CPX5000A7	3CX10,000H3	3CX20,000H3	4CX12,000A/8989	4CX25,000A
3CPX5000U7	3CX10,000U7	3CX20,000H5	4CX15,000A/8281	4CX35,000C/8349
3CX5000A3	3CX15,000A3	4CX3500A	4CX15,000J/8910	4CX40,000G
3CX5000A7	3CX15,000A7	4CX5000A/8170	4CX15,000R	4CX40,000GM
3CX5000H3	3CX15,000B7	4CX5000J/8909	YC130/9019	
3CX10,000A1/8158	3CX15,000H3	4CX5000R/8170W	4CX20,000A/8990	
3CX10,000A3/8159	3CX20,000A3	4CX7500A	4CX20,000B	

TUBE COLLETS

Tube Type	Terminal	Part #	Tube Type	Terminal	Part #
3CW5000A3/8242				Heater	720638
3CX2500A3/8161	Filament (Inner)	149575	3CX5000U7	Heater/cathode	720637
3CX3000A1/8238	Filament (Outer)	149576		Grid	720636
3CX3000A7					
3CW5000A7					
	Heater (inner)	008280		Heater	720638
	Heater (outer)	008291	3CX10,000U7	Heater/cathode	720637
3CX400U7/8961	Cathode	008292		Grid	720636
	Grid	882931		Anode	720635
	Anode (cooler)	154418			
	Heater (inner)	008290	4CPX250K/8590	Heater	008290
	Heater (cathode)	154684	4CX250K/8245	Heater/cathode	008291
3CX600U7	Grid	154685	4CX250M/8246	Grid	008292
	Anode (cooler)	154683	4X150G/8172	Screen	882931
	Anode (contact ring)	154418		Anode (cooler)	008294
	Grid	882931			
3CX800A7	Grid (w/socket mounting)	720359	4CV250,000B	Filament (2 required)	SK-1711
3CPX800A7	Anode (cooler)	720829	4CV250,000C	Grid	SK-1712
			4CW250,000B		
	Heater (inner)	008290			
	Heater (outer)	008291	8538B		
3CX800U7	Cathode	008292	8755	Anode radiator (100 W)	157254
	Grid	882931	8757	Anode radiator (150 W)	157271
	Anode	720829	8847		
			8847A		
	Heater (inner)	135310			
	Heater (outer)	135307	8873	Grid	882931
	Cathode	135306	8874/3CX400A7	Anode (8874 only)	008294
	Grid	135305	8875	Grid (w/socket mounting)	720359
8938	Anode (ring)	135304			
	Anode (cooler)	242955			
			8877/3CX1500A7	Grid	135305
				Grid clip (4 required)	149842
				Anode (cooler)	242955
			3CW2000A7	Grid	135305
			8930	Anode (cooler)	154418
2C39A	7815R/8745	8906AL	Collets are available from Instrument Specialties Co., PO Box A, Delaware Water Gap, PA 18327:		
2C39BA	7815RAL	8907	Anode	Catalog No.	97-20
2C39WA	7855	8907AL	Grid		97-20
7211	7855K	8944	Grid		97-74
7289	7855KAL	Y-579	Cathode/heater		97-76
7698	8533	Y-667	Heater		97-280
7815	8533W	Y-667A			
7815AL	8906				

PARTS KITS

EIMAC Parts Kits are available for repair of the following sockets:

Socket SK-300/SK-300A order Parts kit-300

Socket SK-840 order Parts kit-840

Socket SK-1300/1310/1320 order Parts kit-1300

Socket SK-1500—SK-1510 order Parts kit-1500

See page 160 for detailed description of Parts kits.

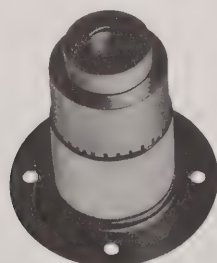
PLANAR TRIODE HEAT SINK ADAPTORS

Socket No.	Chimney No.	Bypass Capacitor		For Tube Type		Comment
		pF	DCWV	EIA#	Catalog #	
SK-3010	Thermal Link*	—	—	8755	8755	Heat sink adaptor for the listed planar triode tube types. (Beryllium oxide)
				8757	8757	
				8847	8847	
				8847A	8847A	
				—	Y518	
SK-3011	Thermal Link*	—	—	—	Y540	Heat sink adaptor for the listed planar triode tube type. (Beryllium oxide)
					Y540	
SK-3012	Thermal Link*	—	—	—	Y540	Heat sink adaptor for the listed planar triode tube type. (Beryllium oxide)
SK-3020	Thermal Link*	—	—	—	Y540	Heat sink adaptor for the listed planar triode tube types. (Beryllium oxide)
					Y634	
SK-3060	Thermal Link*	—	—	8940	8940	Heat sink adaptor for the listed planar triode tube types. (Beryllium oxide)
				8941	8941	
				8942	8942	
				—	Y678 ¶	
				—	Y690 #	
SK-3064	Thermal Link*	—	—	8941	8941	Heat sink adaptor for the listed planar triode tube types. (Beryllium oxide)
				8942	8942	
				—	Y678 ¶	
				—	Y690 #	

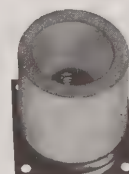
* Before use read EIMAC OPERATING HAZARDS sheet

8941 with solder terminals

¶ 8942 with solder terminals



SK-3010



SK-3020

SPECIAL SOCKETS, PURCHASED AND AVAILABLE FOR EIMAC CUSTOMERS

EIMAC NO.

048291
149990
149998
154353
(SK-1900)

FOR TUBE TYPE

4-65A, 4PR65A
8252W/4PR60C
304TL, 304TH
8873, 8874/3CX400A7, 8875, 3CX800A7, 3CPX800A7

HEAT DISSIPATING CONNECTORS

EIMAC HR Heat Dissipating Connectors are used to make electrical connections to the plate and grid terminals of EIMAC Tubes, and at the same time, provide efficient heat transfer from the tube element and glass seal to the air. These connectors are machined from solid dural rod and are supplied with the necessary set screws. For marking per MIL-STD-130B add prefix letter "M" to the part number.

Type	Height	Dia.	Hole Dia.
HR-6	7/8"	3/4"	.367"
HR-7	1-11/32"	1-3/8"	.127"
HR-8	1-11/32"	1-3/8"	.575"
HR-9	1-11/32"	1-3/8"	.569"



HEAT DISSIPATING CONNECTORS (Cross-Reference)

EIMAC HR Heat Dissipating Connectors are used to make electrical connection to the plate and grid terminal of some EIMAC glass envelope/internal anode tubes, and at the same time, provide efficient heat transfer from the tube element and glass seal to the air. The connectors are machined from dural rod and are supplied with the set screws. Dimensions shown are in inches.

Tube	Plate Connector	Grid Connector
3-500Z	HR-6	--
3-1000Z/8164	HR-8	--
3-1000H	HR-8	--
4-65A	HR-6	--
4-125A/4D21	HR-6	--
4-250A/5D22	HR-6	--
4-400B/7527	HR-6	--
4-400C/6775	HR-6	--
4PR60C/8252W	HR-8	--
4PR65A/8187	HR-6	--
4PR125A/8247	HR-6	--
4PR250C/8248	HR-6	--
4PR1000A/8189	HR-8	--
4-500A	HR-6	--
4-500B	HR-6	--
4-1000A/8189	HR-8	--
5-500A	HR-6	--

Tube	Plate Connector	Grid Connector
250TH-TL	HR-6	--
253	HR-8	--
304TH-TL	HR-7	HR-6
450TH-TL	HR-8	HR-8
5867A	HR-6	--
6155	HR-6	--
6156	HR-6	--
6775/4-400C	HR-6	--
7527/4-400B	HR-6	--
8960	HR-8	--

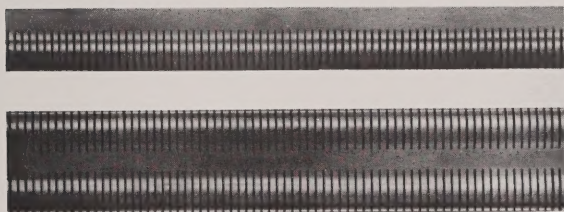
SK-604**TUBE EXTRACTORS**

This tube extractor is designed for use in removing coaxial-base and 9-pin-base tubes from their sockets without damage. The 4X150 series and 4CX250 series tubes may be removed with this extractor.

**SK-605**

These special pliers are designed for use in removing breechlock base tubes from their sockets without damage. The 4CX300 series and 4CX1000/4CX1500 series tubes may be removed with these pliers.

For 8933 use EIMAC extractor 157521.

PREFORMED CONTACT FINGER STOCK

EIMAC Preformed Finger Stock is a prepared strip of spring material slotted and formed into a series of fingers designed to make a sliding contact. It is especially suitable for making connections to tubes with coaxial terminals or to moving parts, such as long-line and cavity circuits or screen-room doors. EIMAC finger stock is available in 9 different shapes and sizes, three of which incorporate "spooned" contact fingers. All sizes come in standard 36 inch lengths. Stock is available on special factory order in the following semi-finished states: Slotted and formed (Not heat treated or plated). Slotted, formed, and heat treated (Not plated). Slotted, formed, and plated (Not heat treated). Untreated and unplated stock are listed as CF101, CF301, CF501 and CF901.

Type	Finger Radius (Inches)	Finger Width (Inches)	Slot Width (Inches)	Slot Depth (Inches)	Comments
CF-100 (*)	1/16	1/8	0.040	9/32	spooned
CF-200	1/16	1/8	0.040	9/32	double-edged
CF-300 (*)	13/64	1/8	0.040	19/32	finger tip has reverse radius
CF-400	13/64	1/8	0.040	35/64	double-edged
CF-500 (*)	16/32	1/8	0.040	7/8	finger tip has reverse radius
CF-600	15/32	1/8	0.040	29/32	double-edged with reverse tip radii
CF-700	1/16	1/8	0.040	9/32	spooned
CF-800	1/16	1/8	0.040	15/32	spooned and bent
CF-900 (*)	0.030	1/16	0.020	15/64	smallest fingers

*Available untreated and unplated

varian®
power grid tube products

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